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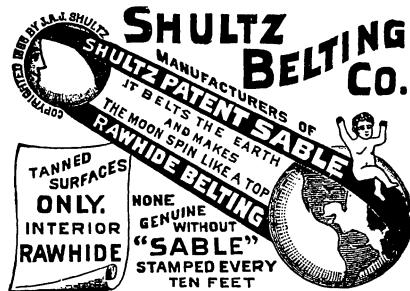
A Review of the Hardware, Iron and Metal Trades.

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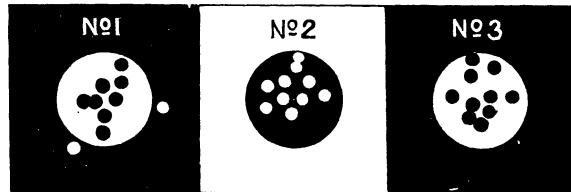
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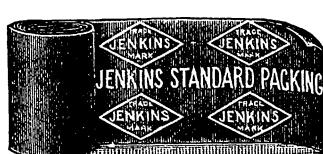
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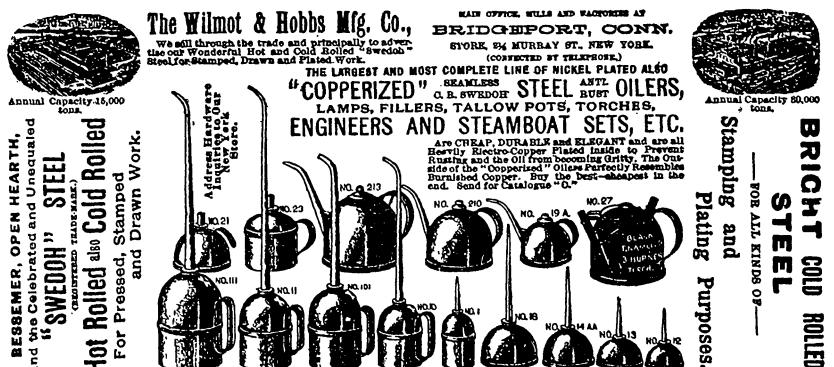
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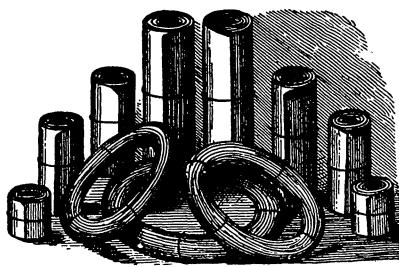
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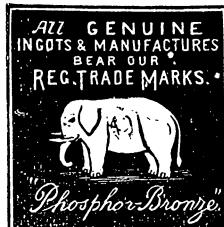
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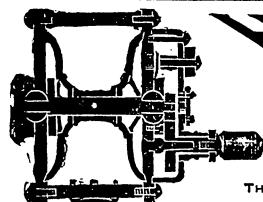
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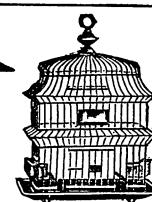
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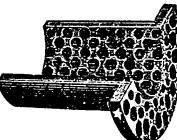
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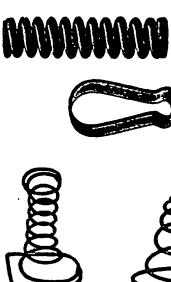
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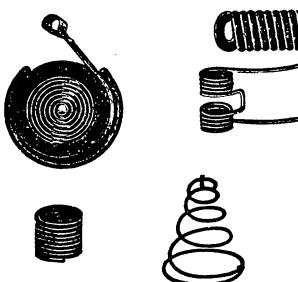
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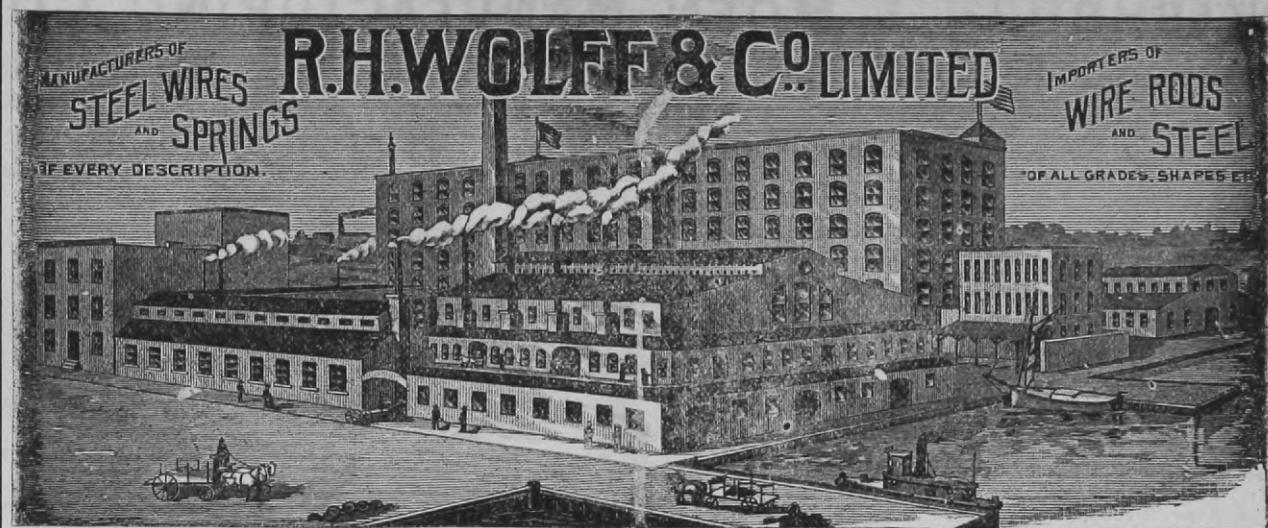
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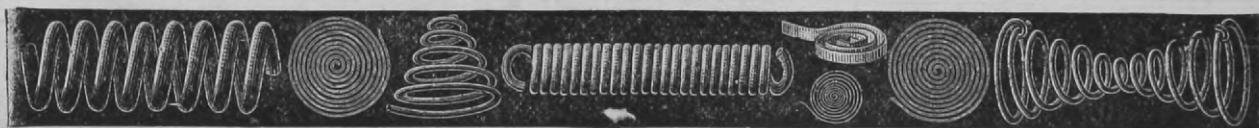
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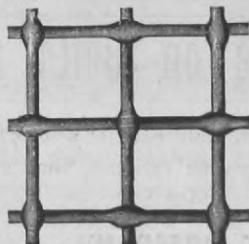
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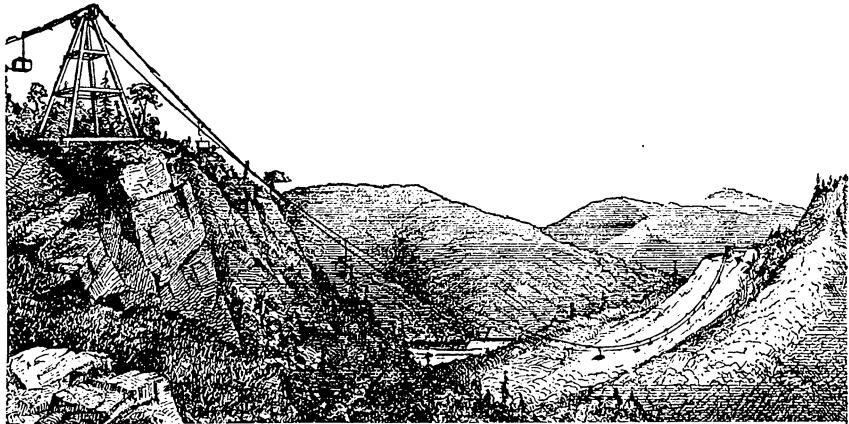
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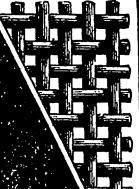
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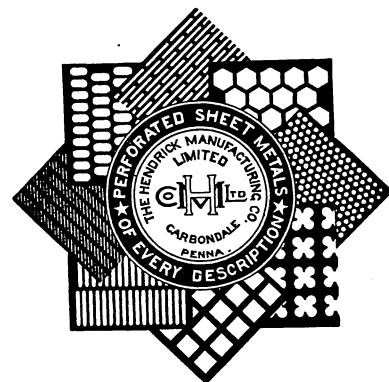
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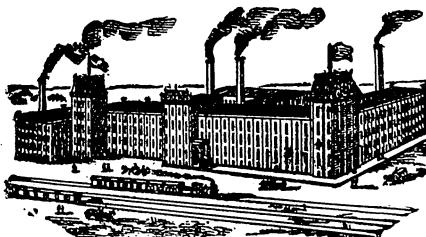
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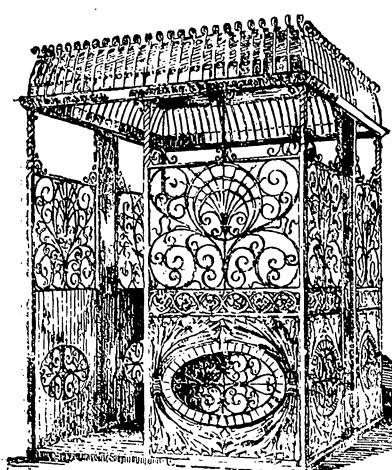
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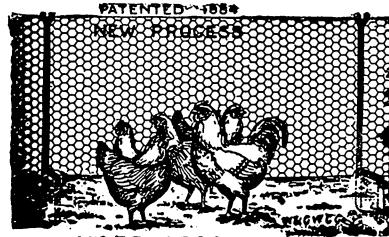
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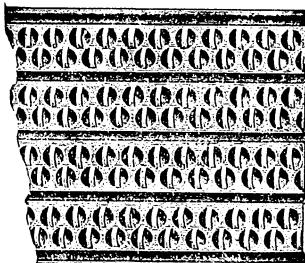
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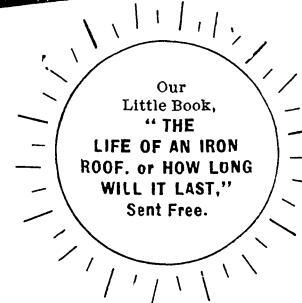
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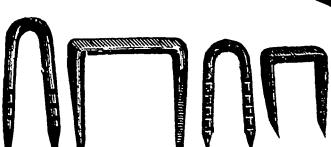
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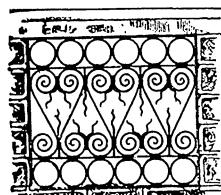
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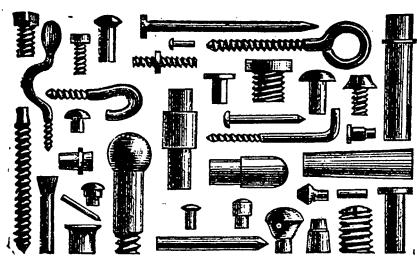
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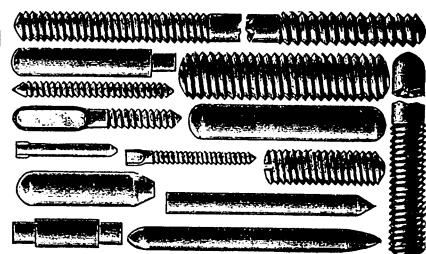
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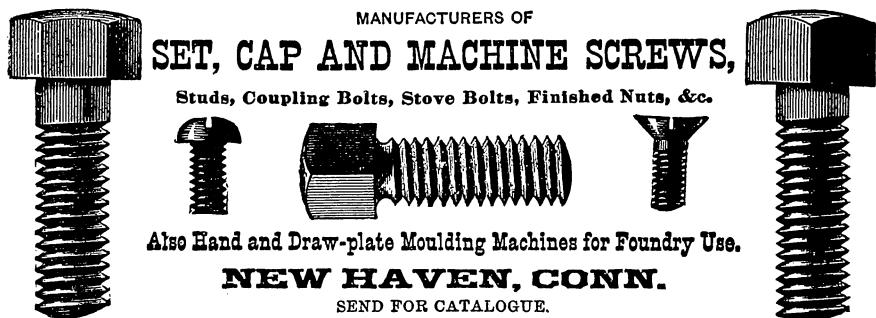
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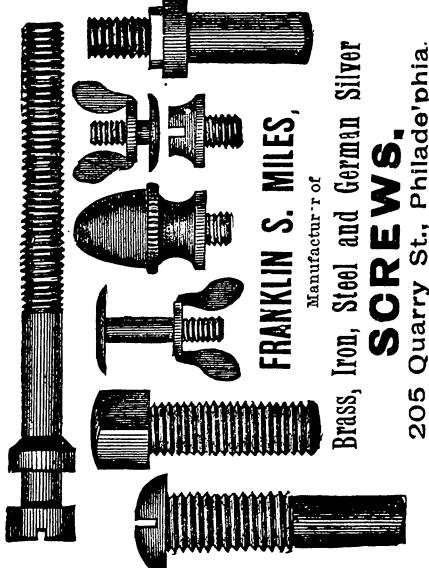
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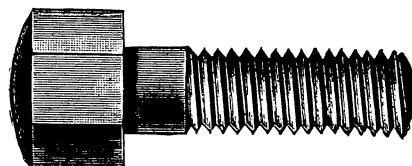
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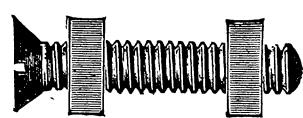
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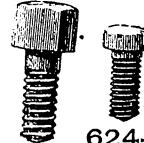
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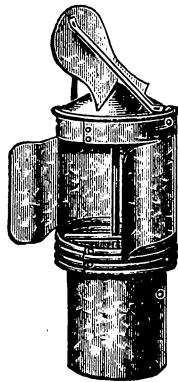
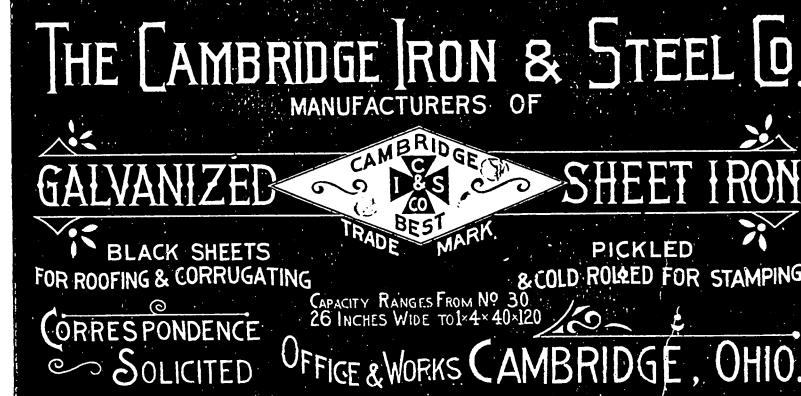
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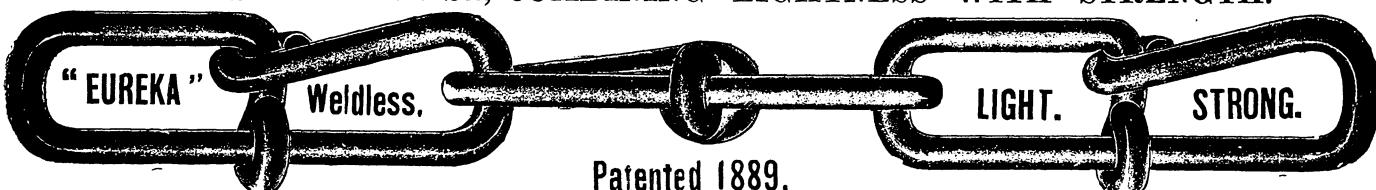
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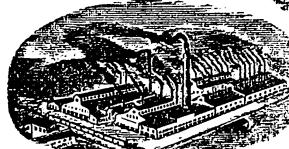
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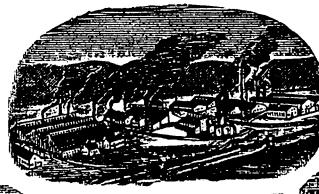
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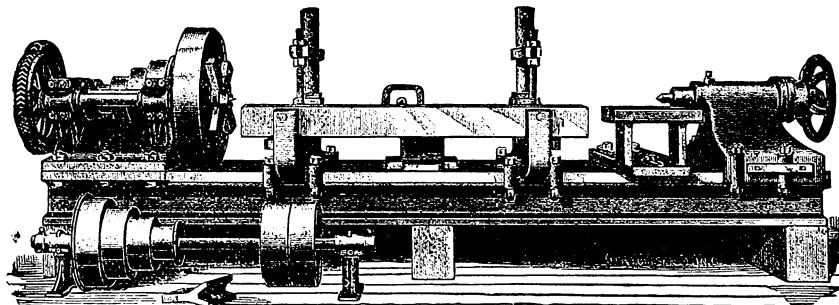
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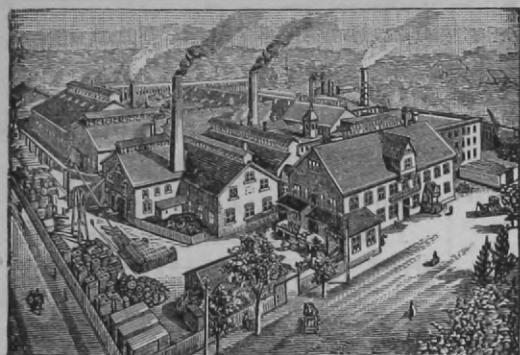


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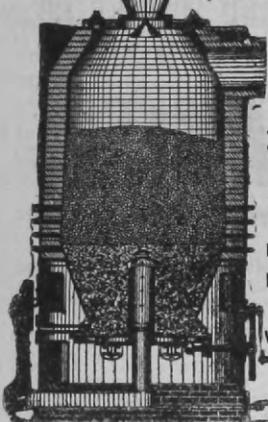
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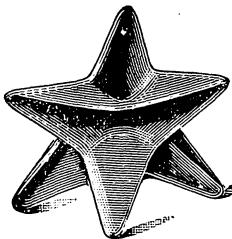
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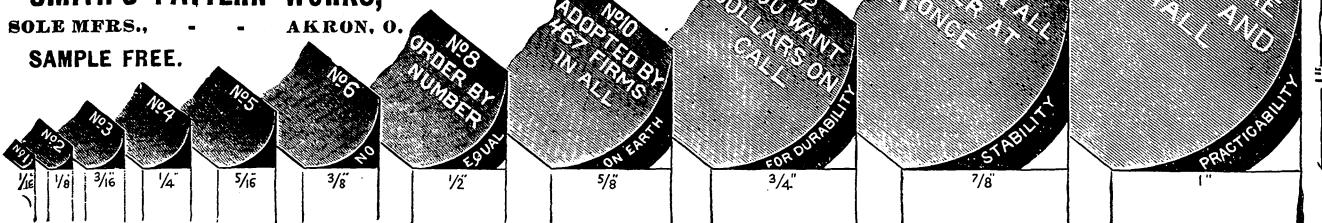
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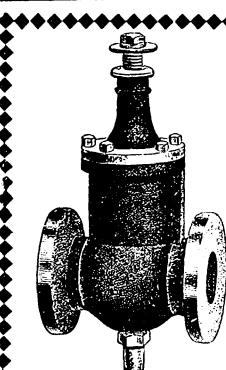
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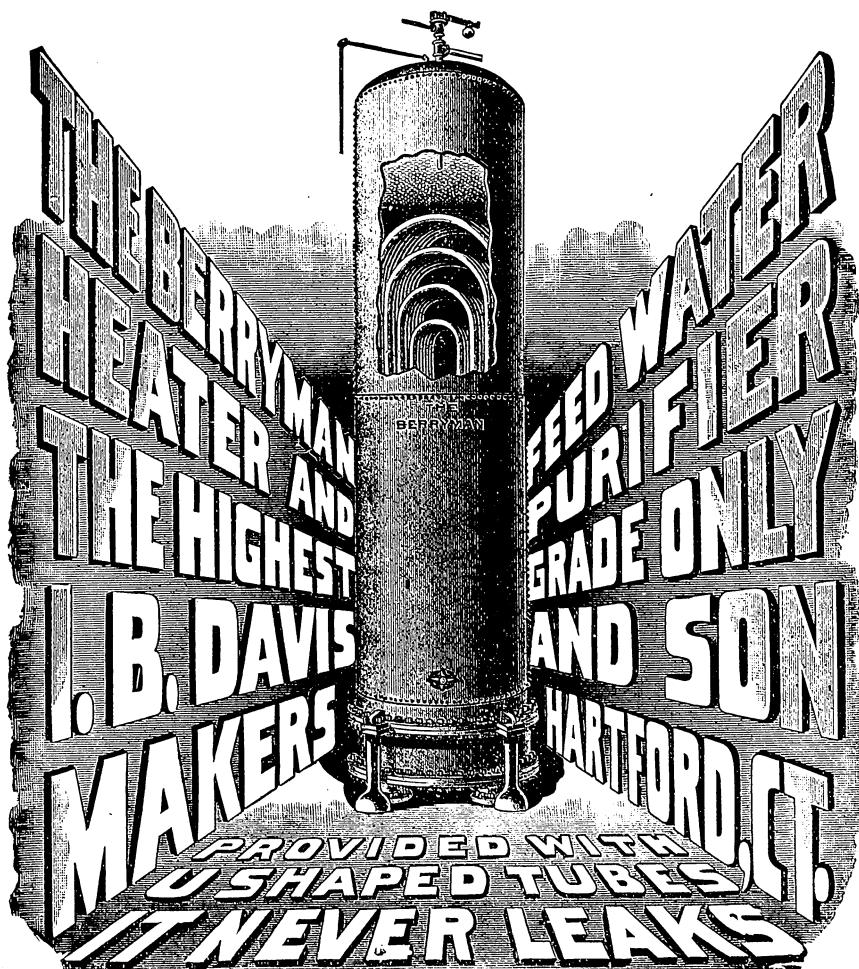
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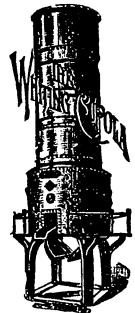
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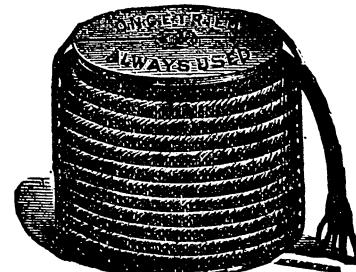
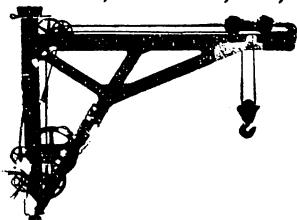
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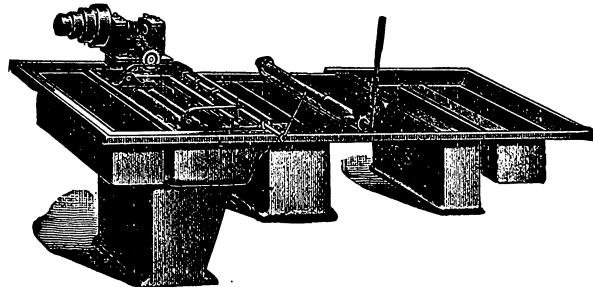
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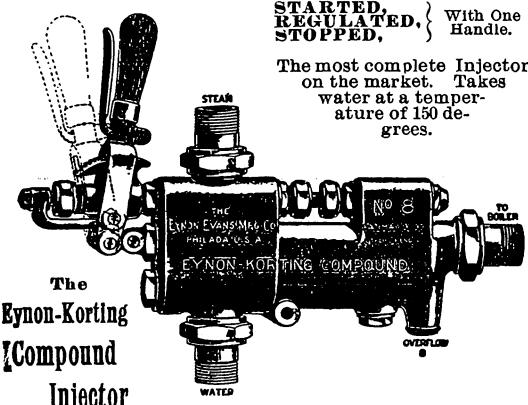
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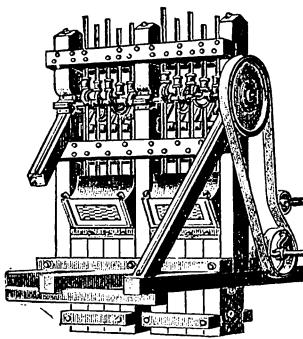
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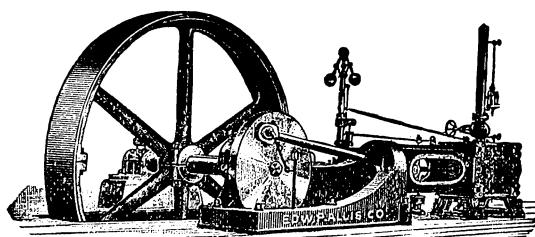
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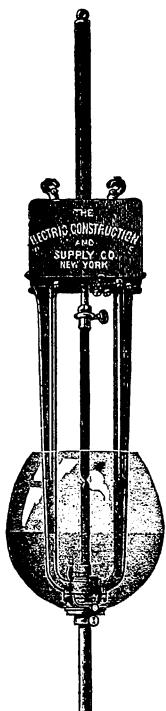
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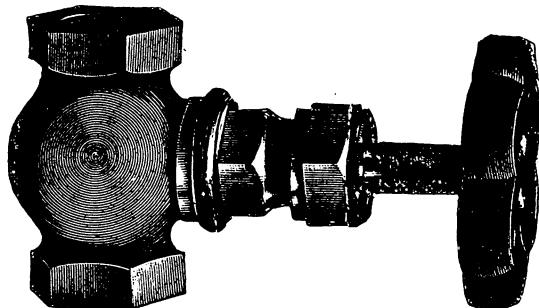
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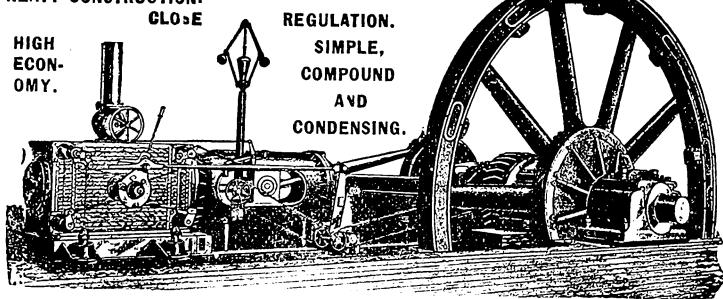
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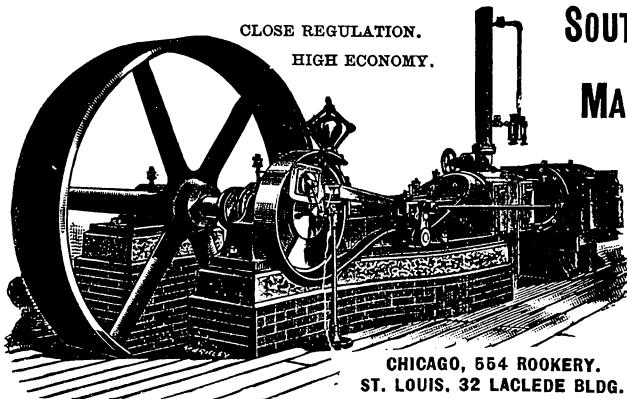
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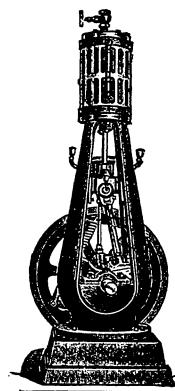


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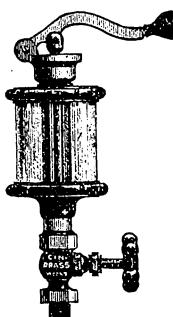


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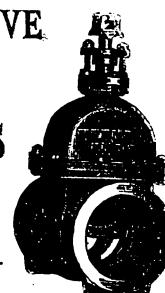
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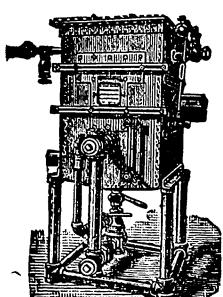
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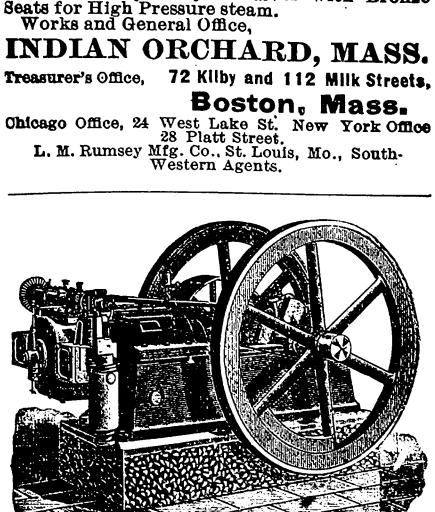
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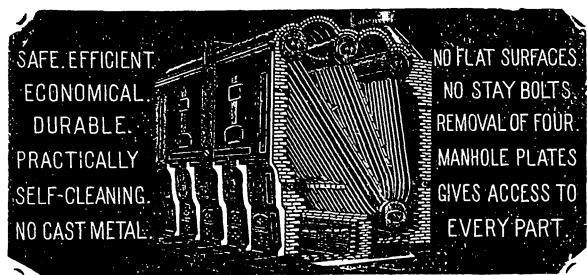
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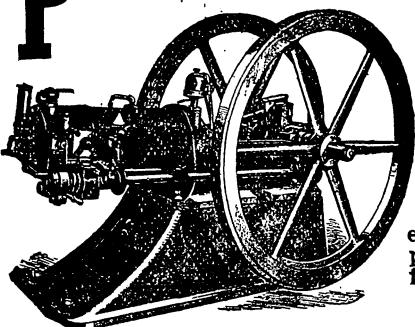
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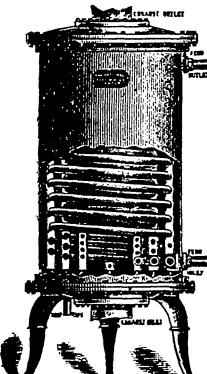
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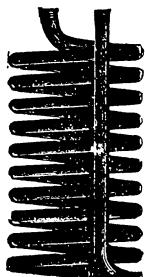
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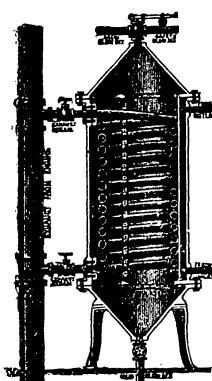
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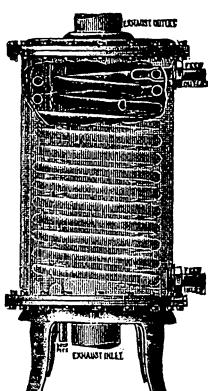
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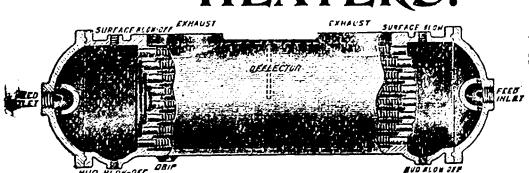
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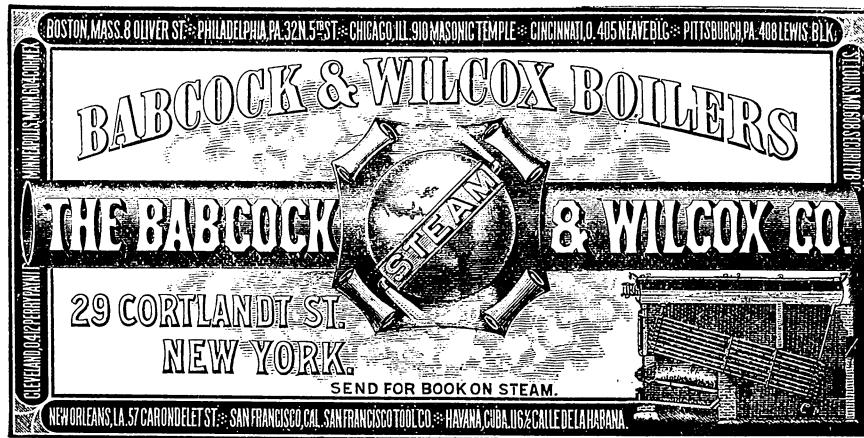
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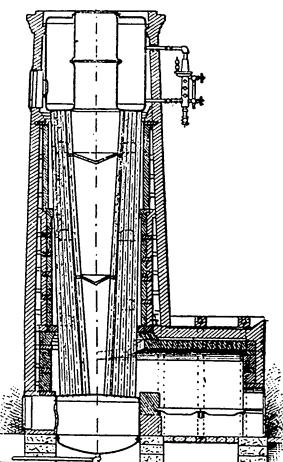
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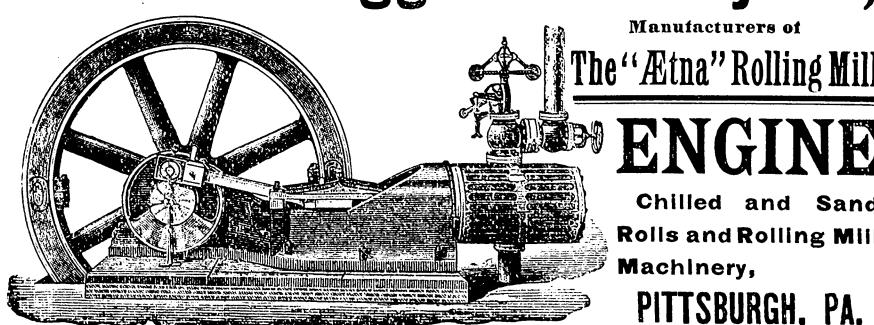
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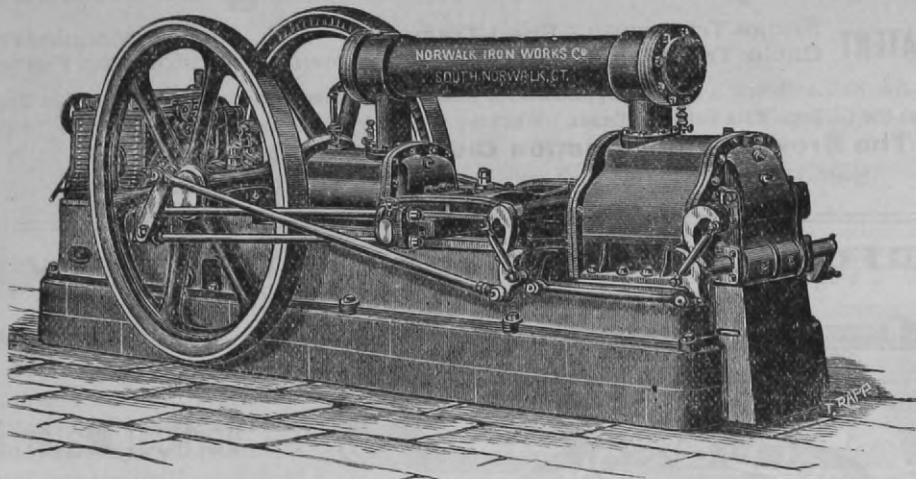
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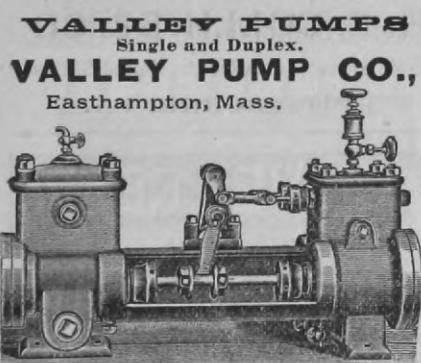
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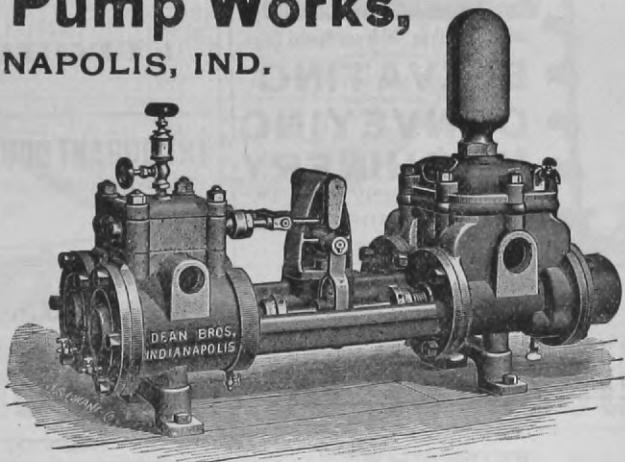
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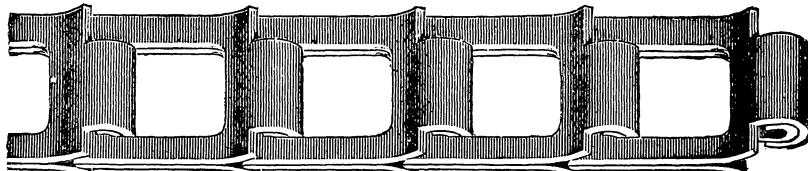
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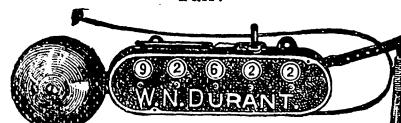
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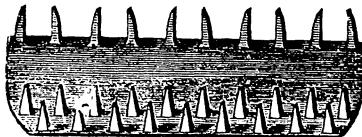
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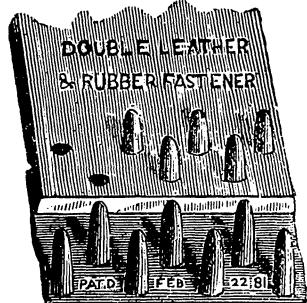
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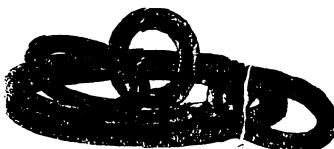
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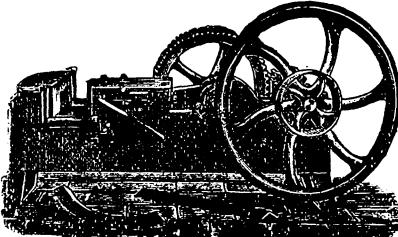
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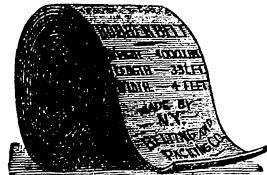
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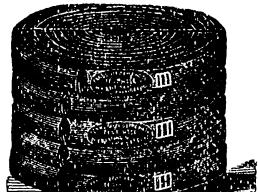
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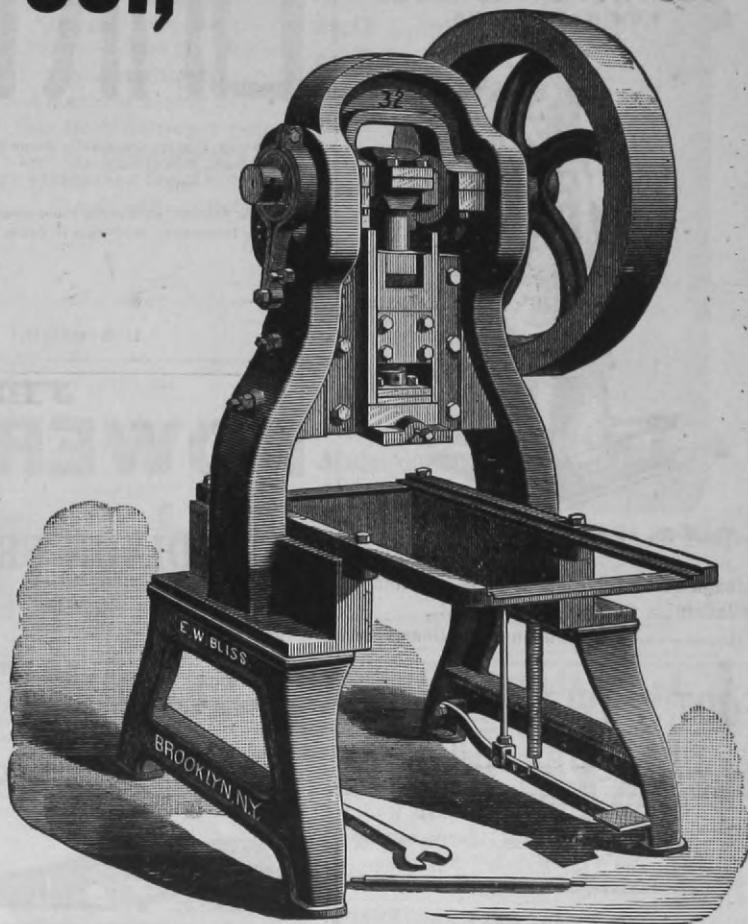
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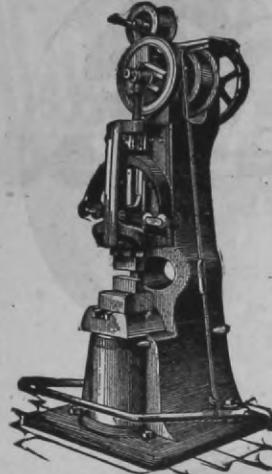
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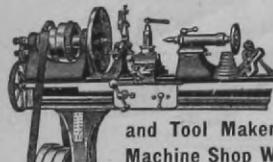
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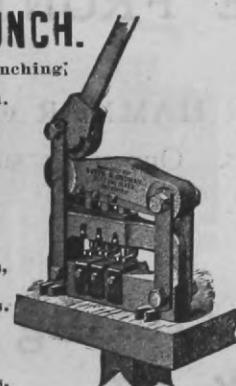
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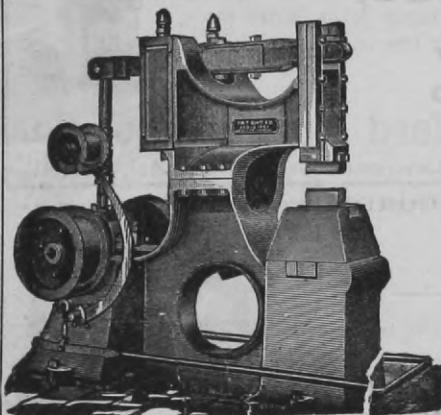
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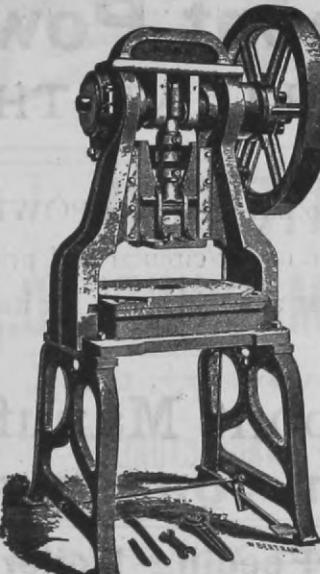
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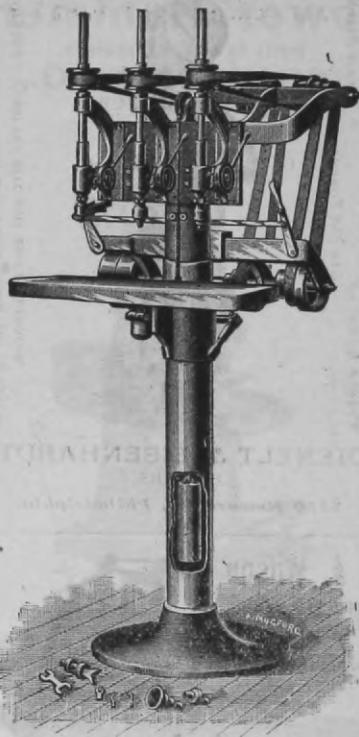
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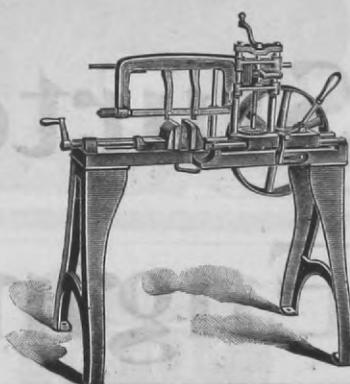


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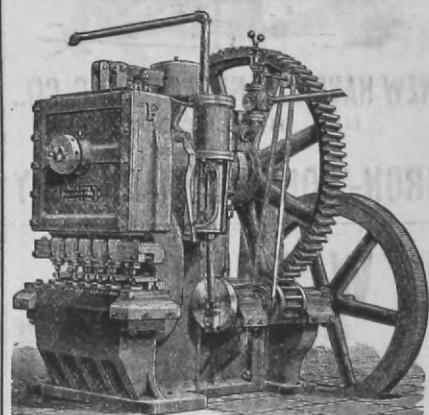
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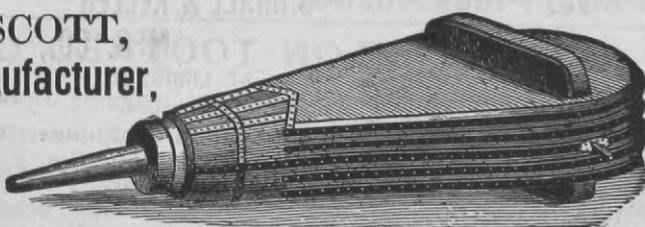
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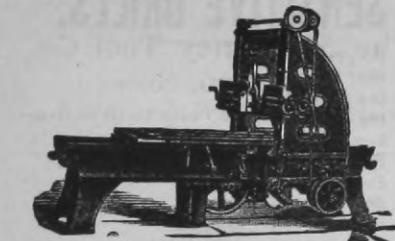
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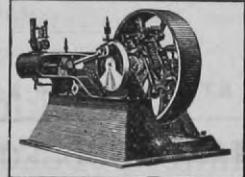
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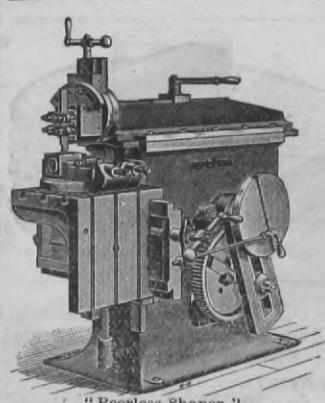
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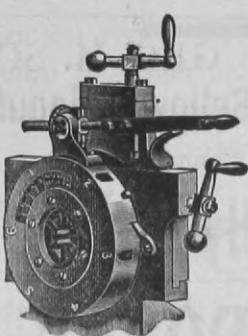


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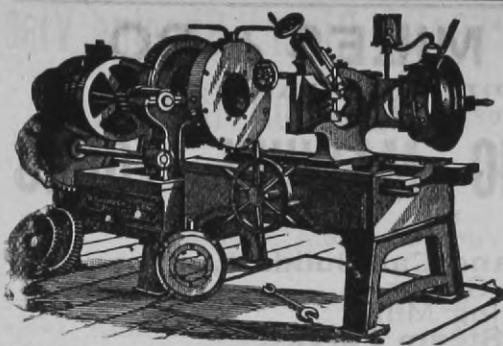
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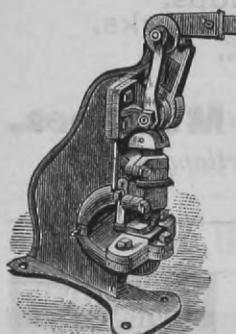
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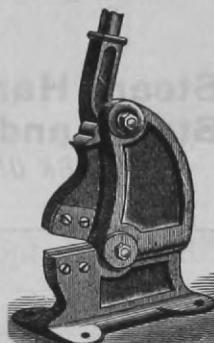
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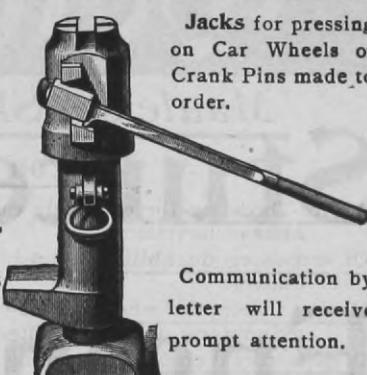
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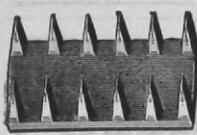
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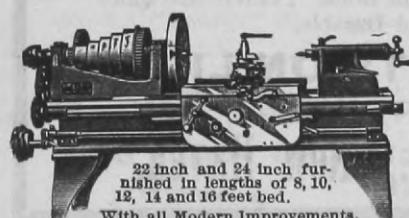
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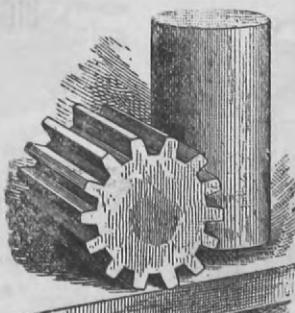
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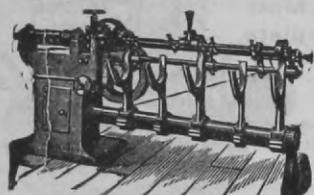
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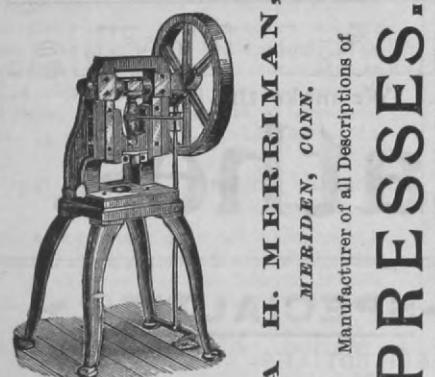
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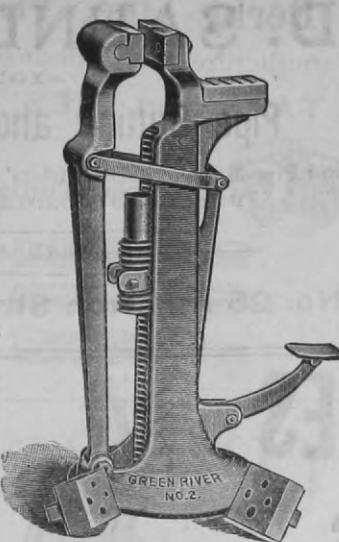
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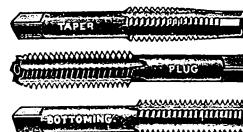
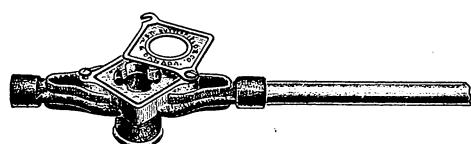
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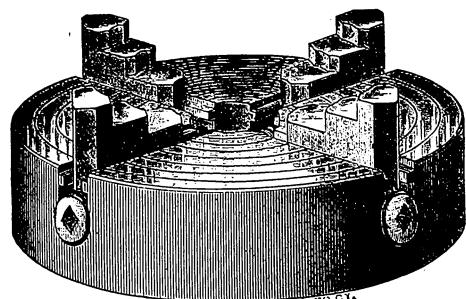
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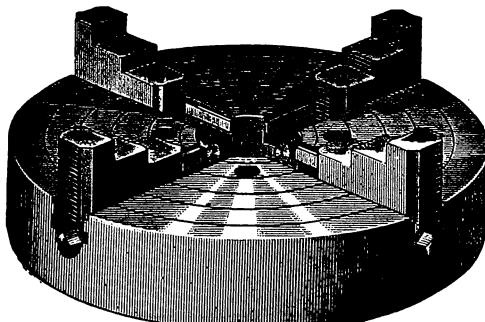
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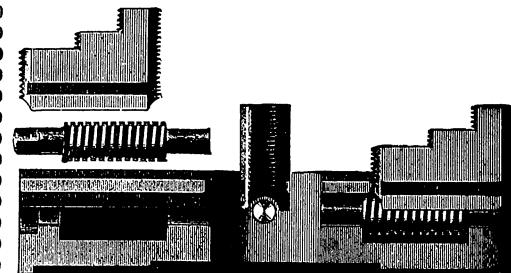
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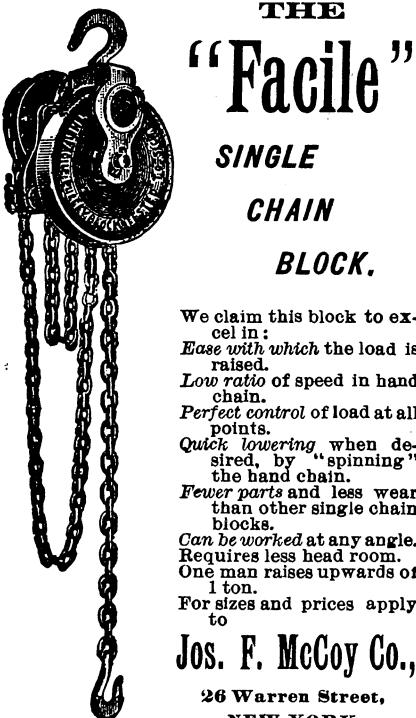


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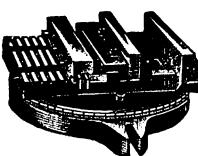
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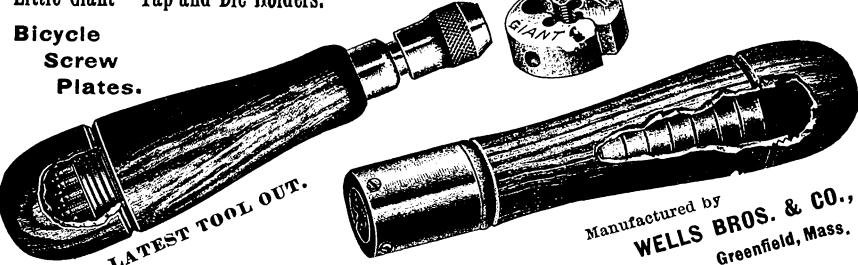
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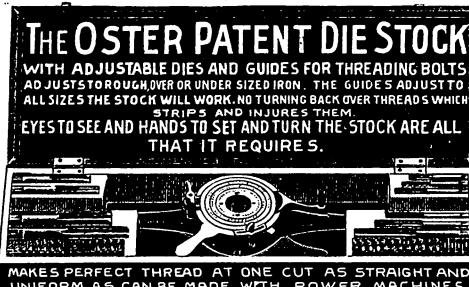
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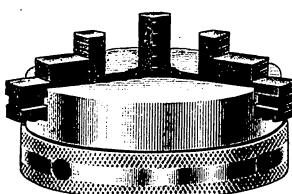
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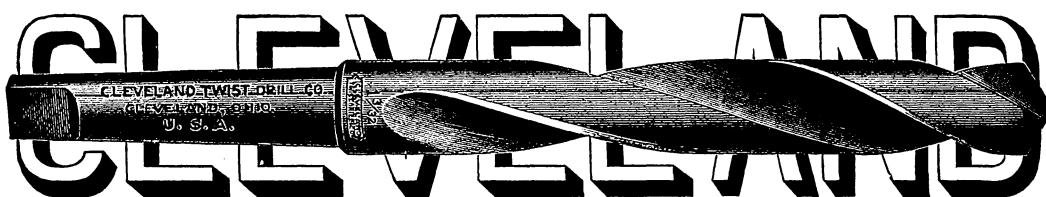
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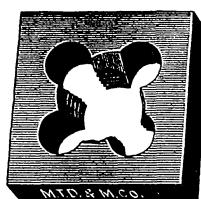
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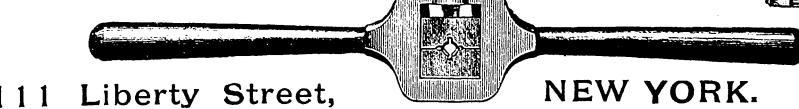
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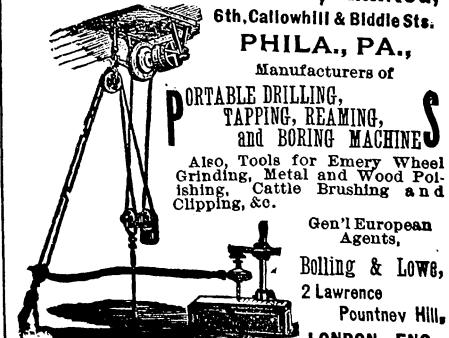
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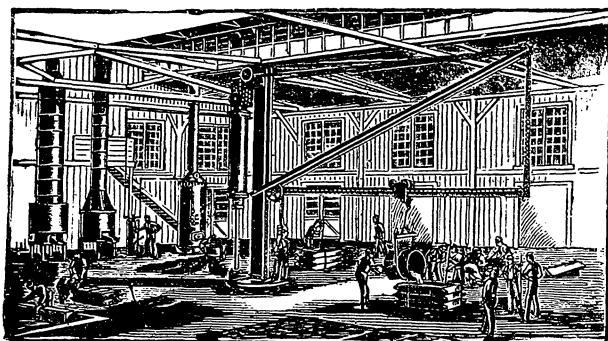


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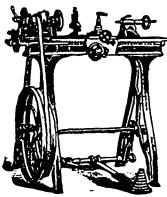
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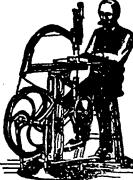


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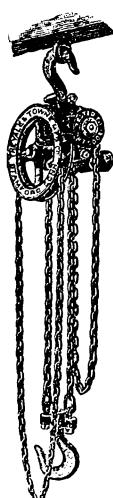
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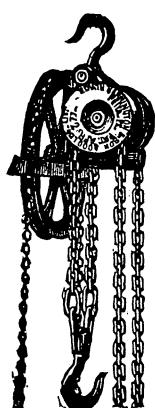
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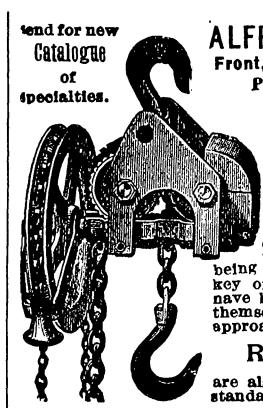
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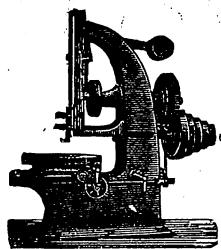
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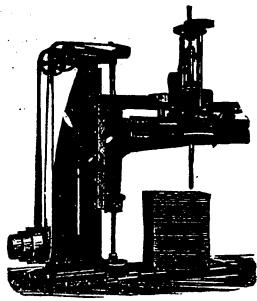
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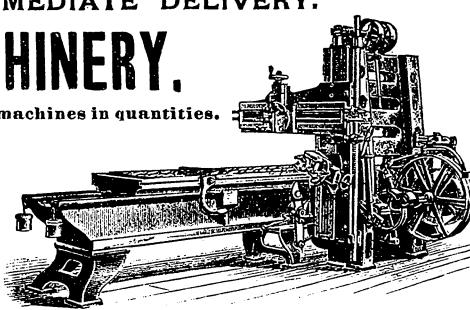


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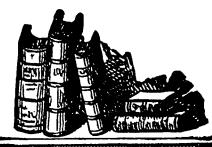
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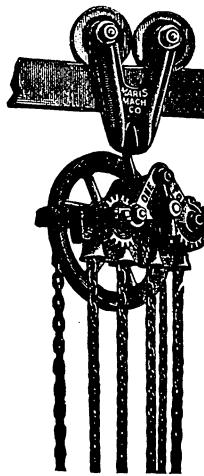
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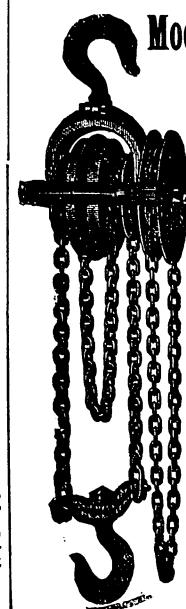
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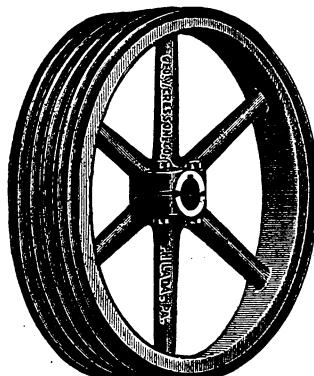
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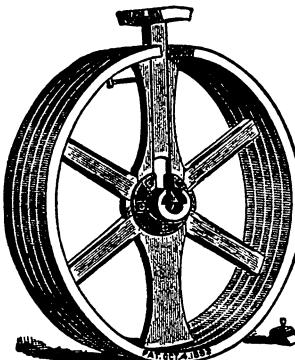
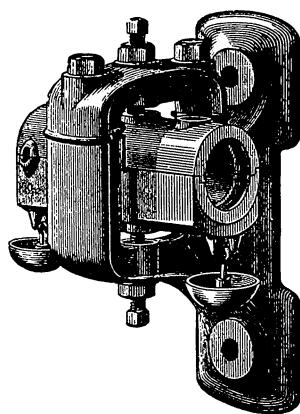
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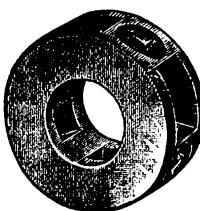
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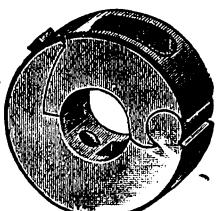
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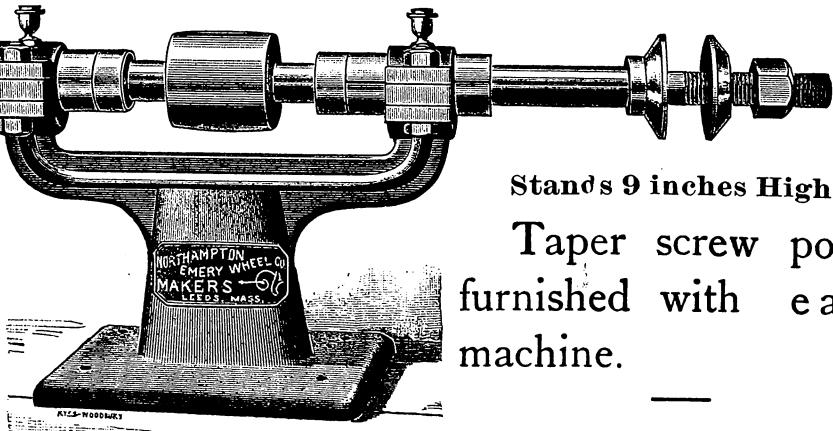
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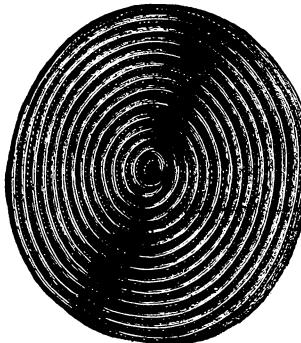
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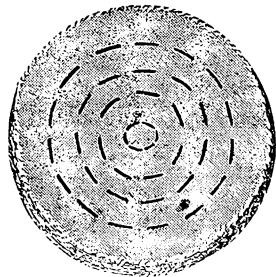
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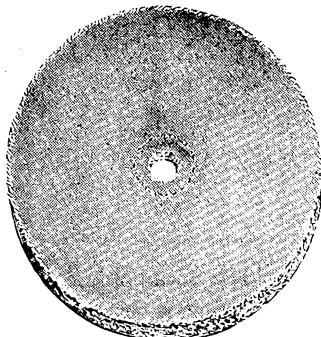
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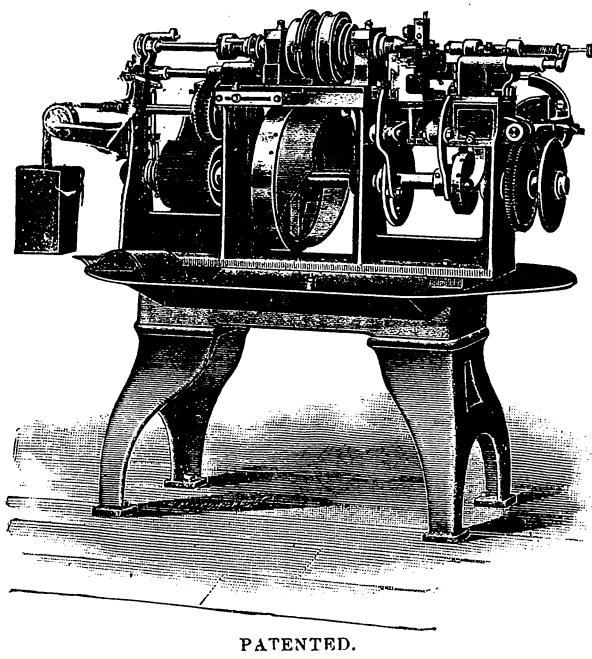
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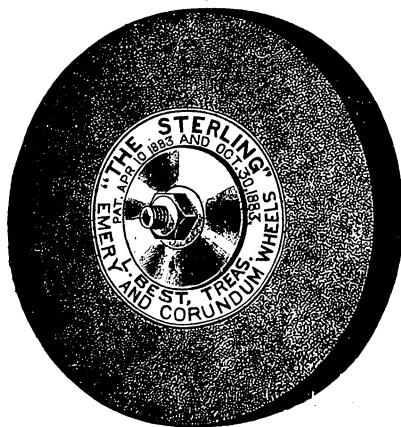
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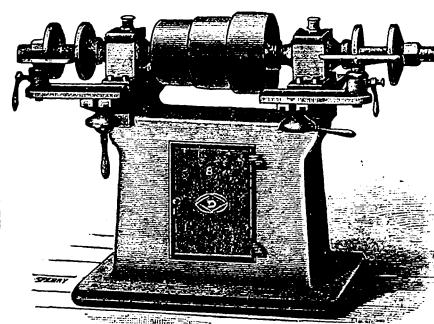
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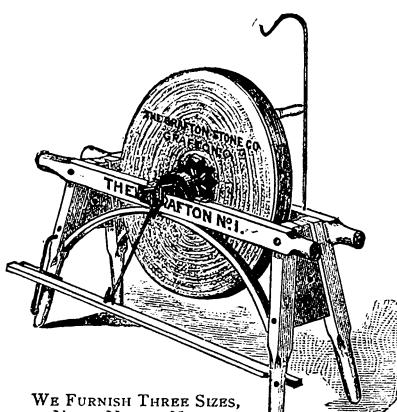


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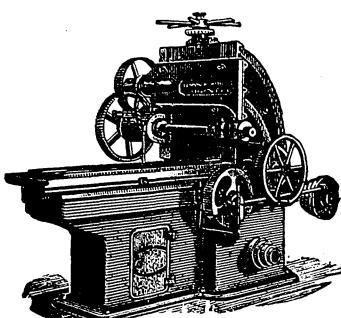
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16 in. x 16 in. x 3 ft. Pratt & Whitney.

18 in. x 18 in. x 4 ft. Putnam Planer.

22 in. x 20 in. x 5 ft. Putnam Planer.

25 in. x 25 in. x 5 1/2 ft. Huebner. (Screw.)

24 in. x 24 in. x 6 ft. Pease.

24 in. x 24 in. x 6 ft. Whitcomb.

36 in. x 34 in. x 18 1/2 ft. L. W. Pond.

51 in. x 45 in. x 15 1/2 ft. New Haven.

16 in. x 16 in. x 12 in. Belden. (Crank.)

16 in. x 16 in. x 3 ft. Pratt & Whitney.

18 in. x 18 in. x 4 ft. Putnam Planer.

22 in. x 20 in. x 5 ft. Putnam Planer.

25 in. x 25 in. x 5 1/2 ft. Huebner. (Screw.)

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22 in. x 20 in. x 5 ft. Putnam Planer.

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18 in. x 18 in. x 4 ft. Putnam Planer.

22 in. x 20 in. x 5 ft. Putnam Planer.

25 in. x 25 in. x 5 1/2 ft. Huebner. (Screw.)

24 in. x 2

Second-hand Tools. Rails and Cars.

LATHES.

- 13 x 6 Pratt & Whitney Lathe.
- 14 x 5 Wheeler Lathe.
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- 16 x 6 Bogart Lathe.
- 16 x 8 New Haven Lathe.
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- 18 x 6 Putnam Lathe.
- 18 x 8 New Haven Lathe.
- 20 x 10 Porter Lathe.
- 24 x 12 Lodge & Davis Lathe.
- 30 x 20 Putnam Lathe.
- 30 x 28 Selmers Lathe.
- 30 x 30 Gleason Lathe.
- 38 x 18 Perkins Lathe.

PLANERS.

- 22 x 22 x 4 Whitcomb Planer.
- 24 x 24 x 7 New Haven Planer.
- 24 x 24 x 8 Lodge & Davis Planer.
- 30 x 30 x 8 Pease Planer.
- 36 x 30 x 8 Hollingshead Planer.
- 36 x 36 x 8 Cove Planer.
- 36 x 36 x 12 Gleason Planer.
- 40 x 36 x 10 Steepe Planer.

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- 20 in. Lodge & Davis Sliding Head Drill.
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- 32 in. Lodge & Davis Drill.

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- 18 in. Shaper.
- 20 in. Smith & Mills Shaper.
- 20 in. Gould & Eberhardt Shaper.
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- 18 x 6 Automatic Turret Lathe.
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SECOND-HAND MACHINERY.

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- 1 Iron Planer, D. W. Pond, 20 in. x 26 in. x 8 ft.
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- 1 Engine Lathe 24 ft. bed, 64 in. swing, D. W. Pond make, A1.
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- 1 Engine Lathe 20 in. x 12 ft., New Haven. 1.18 in. x 8 ft., New Haven.
- 1 Drilling Machine 40 in., B. G. S. F. 1.36 in., B. G. S. F., both New Haven.
- 1 6 ton Foundry Crane, A1.
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- 2 each No. 18, 19, 20 Bliss Presses.
- 1 each No. 21, 20, 34 Bliss Presses.
- 1 14 in. x 32 in. Watts & Campbell Engine.
- 1 14 in. x 36 in. Watts & Campbell Engine.
- Lists sent. NEW YORK MACHINERY DEPOT,
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- ENGINES, Horizontal and Vertical. All types and sizes up to 2000 H.P.
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Planers, Drills and Lathes, good as new, for cash.

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- 16 in. x 8 ft. Perkins, taper.
- 16 in. x 8 ft. Balsdell.
- 18 in. x 8 ft. New Haven.
- 18 in. x 8 ft. Bradford.
- 18 in. x 8 ft. Balsdell.
- 18 in. x 8 ft. Wm. West.
- 18 in. x 10 ft. D. W. Pond.
- 24 in. x 6 ft. Bullard.
- 24 in. x 12 ft. Geo. Gage.
- 29 in. x 12 ft. Kifield.
- 7 ft. Alfred Box Universal Radial.
- 9 ft. Holly Mfg. Co. Radial.

DRILL PRESSES.

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- No. 2 3-Spindle Garvin.
- No. 3 4-Spindle Garvin.
- No. 4 6-Spindle Garvin.
- 20 in. Biokford, Lever & W.
- 4 in. Aurora, Back Geared.
- 30 in. Pond, Back Geared, P. F.

PLANERS.

- 16 in. x 16 in. x 3 ft. Walker Bros.
- 20 in. x 20 in. x 5 ft. Ames.
- 22 in. x 22 in. x 4 ft. L. W. Pond.
- 24 in. x 24 in. x 6 ft. Whitcomb.
- 24 in. x 24 in. x 5 ft. Putnam.
- 28 in. x 28 in. x 7 ft. New Haven.

MILLING MACHINES.

- No. 1 Pratt & W. Lincoln.
- No. 2 Pratt & W. Lincoln.
- No. 0 Garvin. Universal.
- No. 1 Garvin. Universal.
- No. 5 Brahnrd. Standard Universal.
- No. 3 Garvin Lincoln.
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- No. 3 Garvin Duplex.
- Garvin Heavy Slab Miller.

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- Traverse Head.
- 18 in. Putnam, Traverse Head.
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Also a large number of other machines. Write for complete list and detailed description.

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FOR SALE.

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- Niles Boring and Turning Mill, 37 in., equal new.
- 9 Hewes & Phillips Lathes, 19 in. to 21 in.
- Numerous Engines, Boilers, Pumps, Tanks, Crushers, Compressors, Rock Drills, Hoisting Engines, &c., cheap.
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- Root Blowers, Nos. 1, 2, 5 and 6. 2d hand.
- Haskin Vertical Engine, 9 x 9. 2d hand.
- Improved 3d in. Band Saw. New.
- Vertical Boiler, 40 H. P. 2d hand.
- Open-die Bolt Cutter 1/4 to 1 1/4 in. 2d hand.
- Write us before buying. COOKE & CO., Machinery and Supplies, 163 and 165 Washington St., New York.

FOR SALE.

- Two Double Deck Boilers, 40 H. P., Cheap Iron Tanks, Square, 4 x 4 x 8, 4 x 4 x 8 1/2 x 11. Cylinder Boilers and Flues from 8 in. to 36 in. diameter, for stocks and water. Two Radiators, 25 H. P. Engine and Boiler, Horizontal, 25 H. P. Locomotive Boiler. Iron Columns, several sizes. Oce Lathe, Blow-offs, all sizes.
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Successor to Bussenus & Cunliffe,
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A Question of Changing these Articles into Money.

- A 50 H. P. 13 in. x 24 in. "Wilbraham" Slide Valve Engine in complete order at \$270.
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- Lot Lathe Drip Pans at \$3.00 each.

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Well equipped small Machine Shop at Elizabethport, N. J. 25 H. P. Engine and Boiler complete, Lathe, Shaper, Drill Press, Forge, etc. All with shafting, belting, tools, etc., complete, ready to run. Will be sold cheap or rented to a good tenant. Apply to

LEWIS N. LUKENS,

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SECOND-HAND MACHINERY.

ENGINE LATHES.

10 in., 11 in. and 13 in.
Swing 4 and 5 ft. Bed
Lathes, Reed, Prentiss, and L. & M.
15 in., 16 in., 18 in., 19 in.
and 8 ft. Bed Lathes, Dustin, Pond, Young, Fife and Billard.
24 in., 26 in., 28 in., 32 in.
and 34 in. Swing 10 ft., 16 ft. and 18 ft. Bed
Lathes, Fife, Dustin, Blaisdell and Perkins.

PLANERS.

17 in. x 17 in. x 30 in.
Hand Planer.
16 in., 18 in. x 3 ft.
Crank Planer.
17 in. x 17 in. x 3 ft. L. & M. Planer.
20 in. x 20 in. x 4 ft. L. & M. Planer.
24 in. x 24 in. x 6 ft.
Reese Planer.
27 in. x 27 in. x 5 ft.
White Planer.
60 in. x 60 in. x 22 ft.
Heavy Planer with 4 heads.
60 in. x 60 in. x 22 ft.
Hepworth 1 head.
8 ft. Boring and Turning Mill with pulley
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20 in. Drill Presses,
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3 Slave Drills, one spindle,
two two-spindle.
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6 bench Drills.
150 in. Heavy Geared
Post Drill.
1 each No. 2, 3 and 4
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Swing, 3, 4 and 5 ft.
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1000 tons 60 lb. Steel.	50 tons 35 lb. Iron.
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27 different gauge second-hand locomotives.	

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Price extra for extra tool heads.
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20 in. x 8 ft. Pattern
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Complete plant of machinery of the Hickory Wheel Co., at So. Framingham, Mass., for making bicycles. Run about a year only and as good as new, consisting of

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Two Guild & Garrison Steam Pumps, 18 in. steam cylinders, 12 in. water cylinders, 24 in. stroke, strictly first-class. Capacity 600 gallons each per minute at ordinary speed.

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One No. 5 Root Blower, in use about two years. In perfect condition. Also one Cupola Shell, 72 inches in diameter, 45 feet high, 11 $\frac{1}{2}$ feet to bottom of charging door.

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Heavy Pressure
PUMPS

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Two pairs of

Worthington Compound
Condensing Press. Pumps

14 in. x 24 $\frac{1}{2}$ in. x 8 $\frac{1}{2}$ in. x 18 in. stroke. Adapted to 2000 lbs. pressure per square in. In good order. Complete, with condensers.

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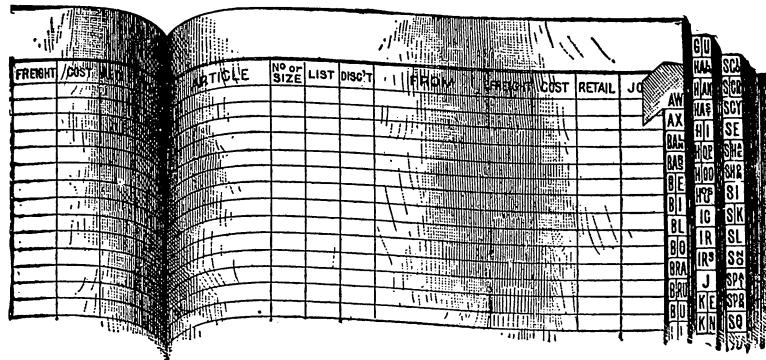
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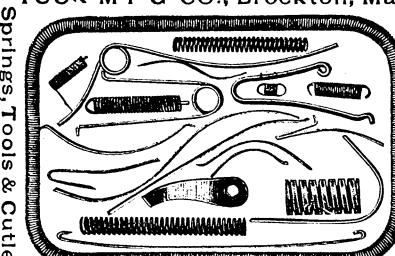
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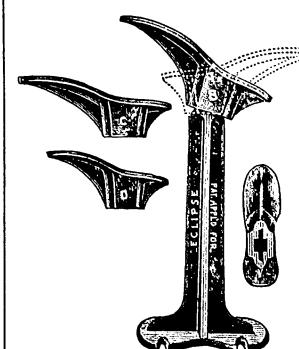
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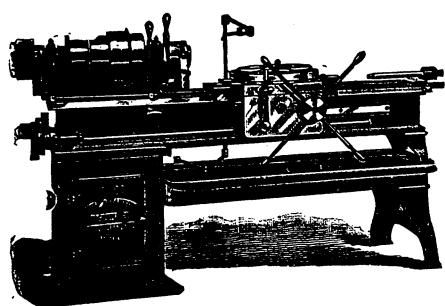
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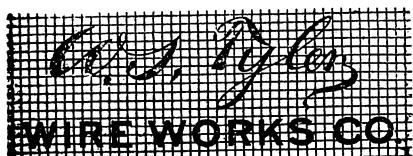
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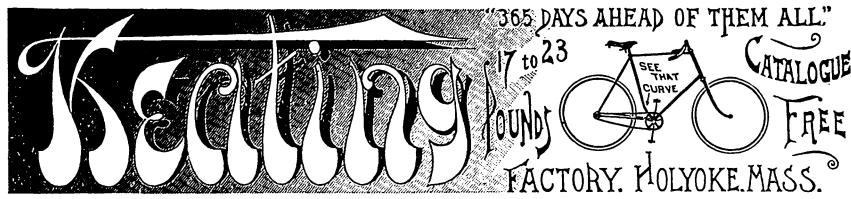


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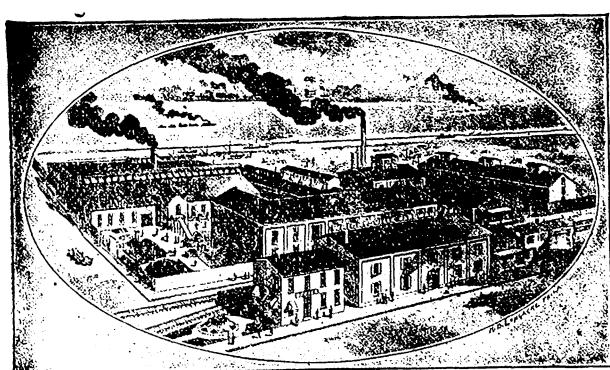
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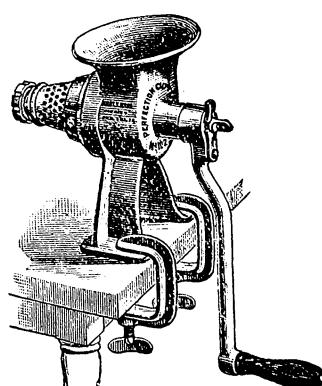
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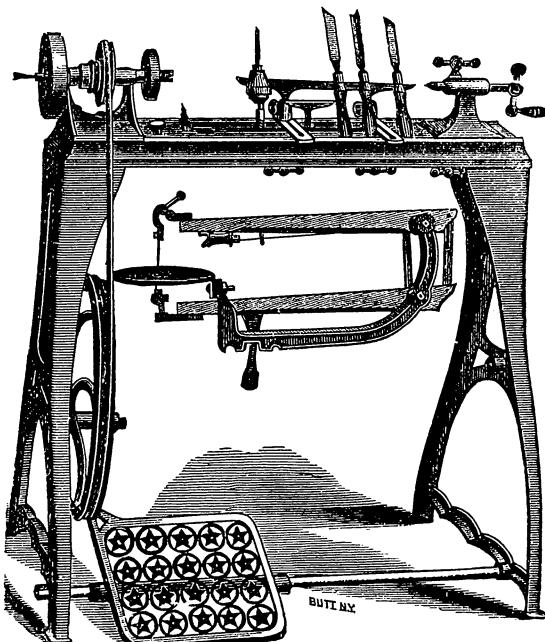


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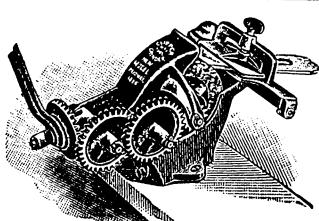
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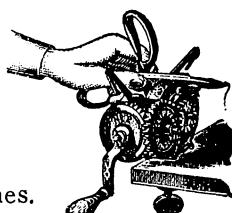
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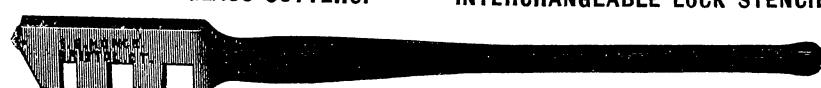


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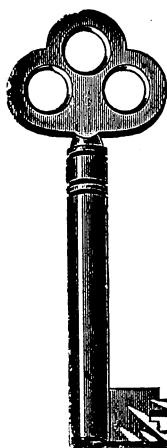
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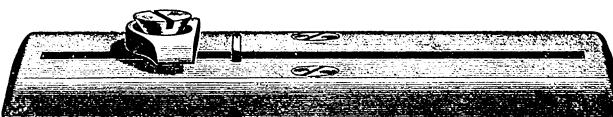
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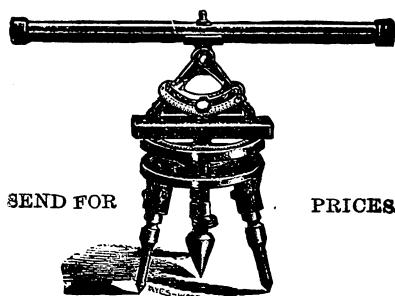
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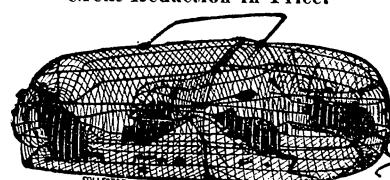
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Fig. 200.

Fig. 381.

Fig. 145.

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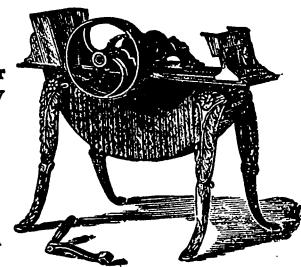
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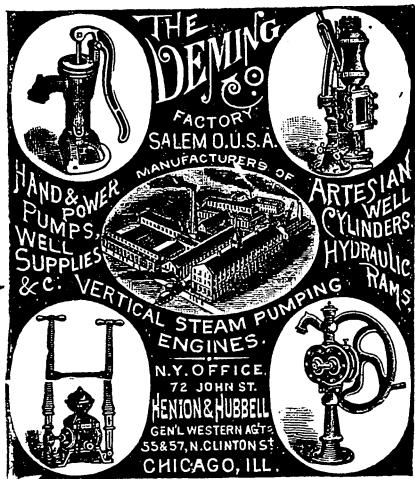
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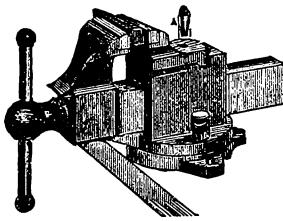


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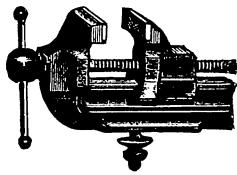


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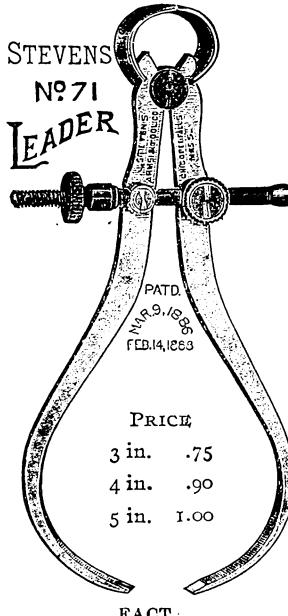


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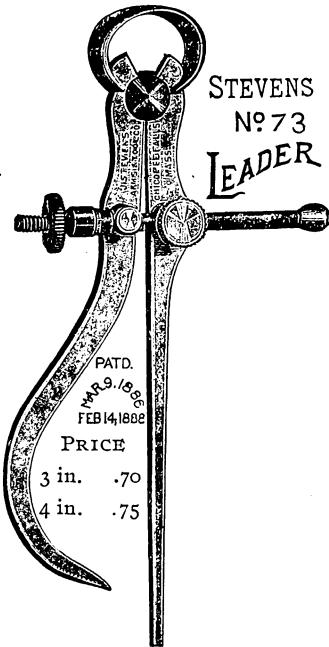
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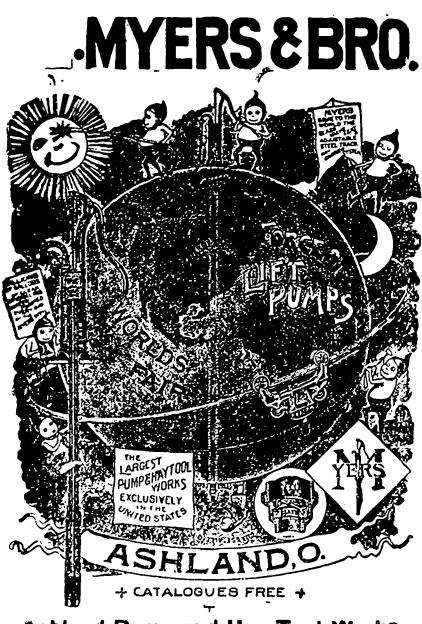
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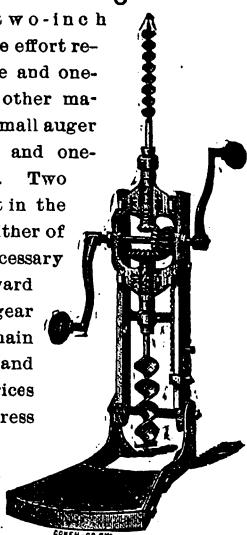
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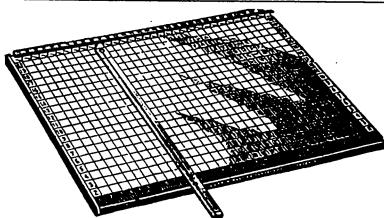
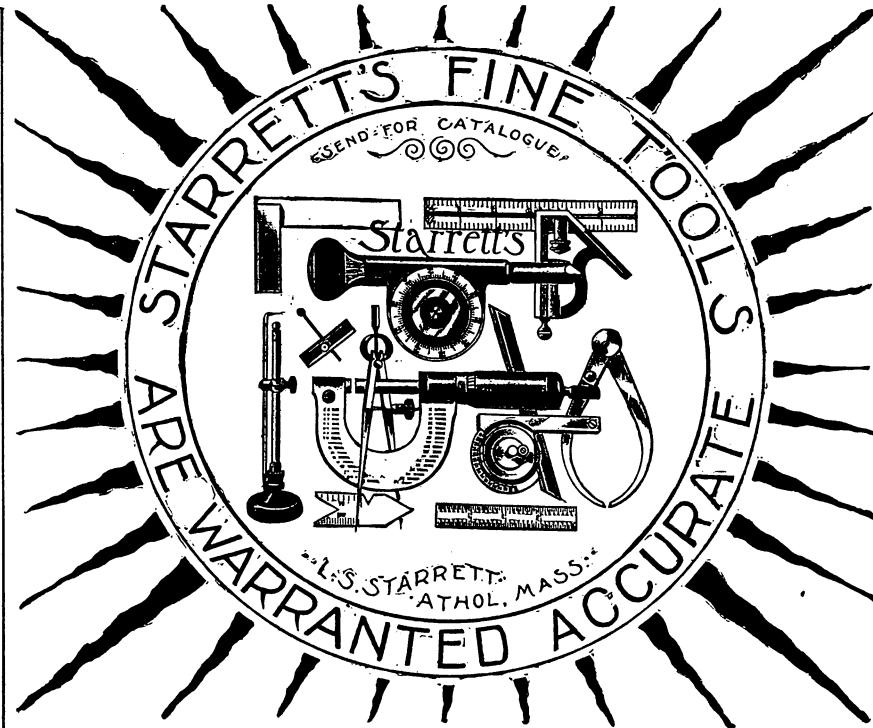
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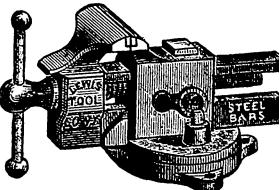
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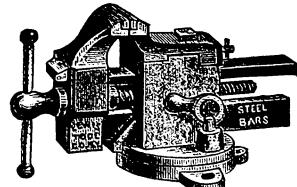
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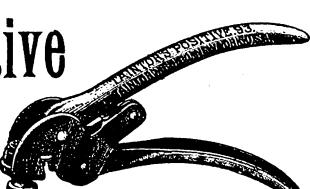
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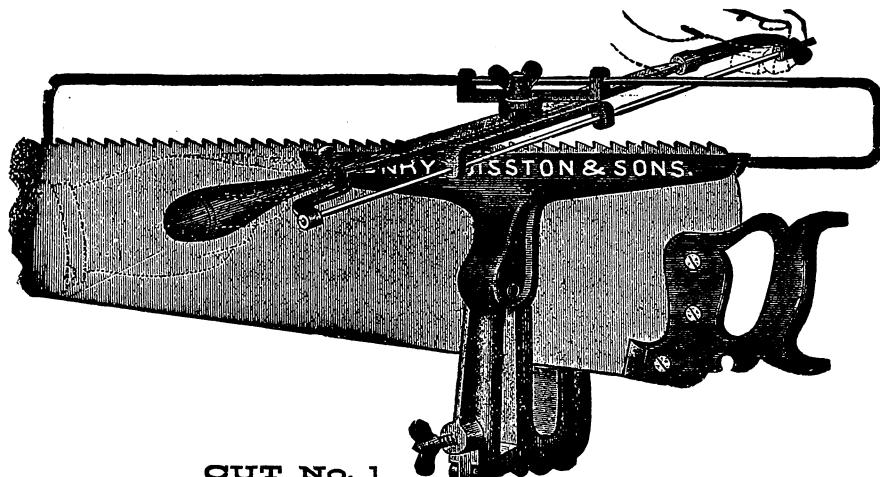
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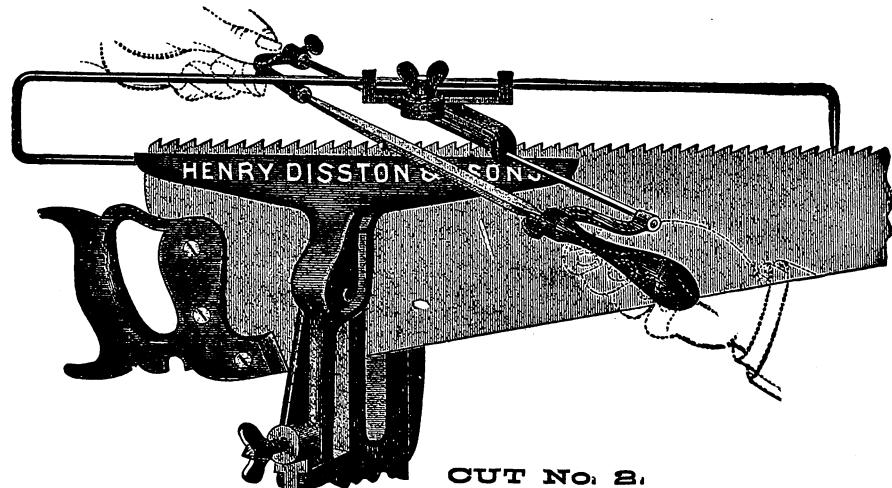
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CUT No. 2

To obtain the correct position, loosen the wing nut and move the guide around to the point desired; after tightening wing nut, loosen screw in file handle, then turn handle until file gives the shape tooth wanted.

A good way is to select a tooth of correct shape and let file down into it, tighten set screw in handle, then file a tooth to see if the shape suits. If not turn the file a little to the right or left and try another tooth until the proper shape is obtained. Then file every other tooth, see cut No. 1; when one side is filed, reverse saw and attachment and adjust as in No. 2, and file the other teeth. For Rip Saws, place the file at right angles with the saw and file every tooth. Always keep the file as nearly horizontal as possible.

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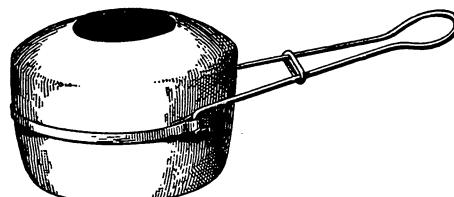


Fig. 108.—Clamp for Holding Tea Kettle while Being Tinned.

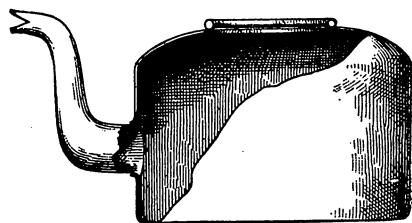


Fig. 110.—Tea-Kettle, Showing Spout Attached.



Fig. 107.—Planishing Tea-Kettle Side.

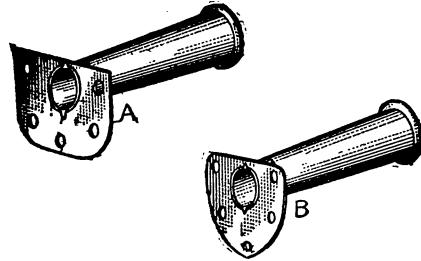


Fig. 54.—Way to Put the Flaps On.

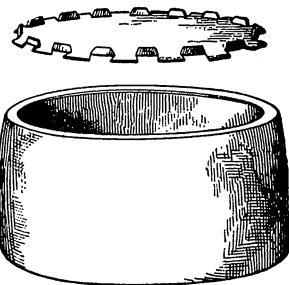
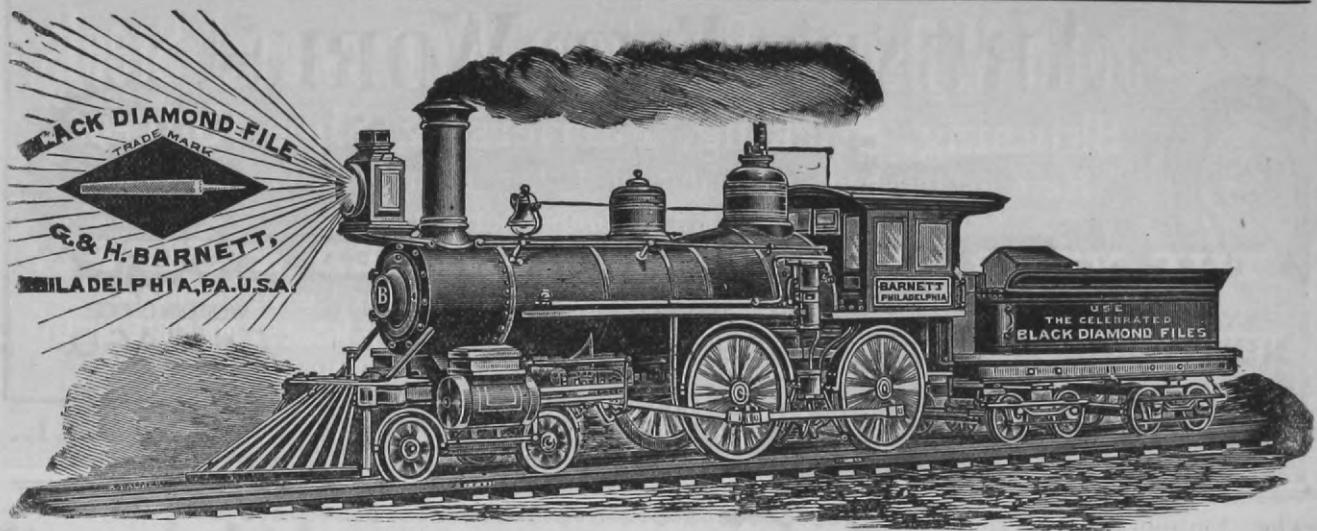


Fig. 105.—Putting in Bottom.

The above are Specimen Illustrations from "The Art of Coppersmithing," and indicate the Practical Nature of the Treatise, and how it Goes into All the Details of Workmanship.

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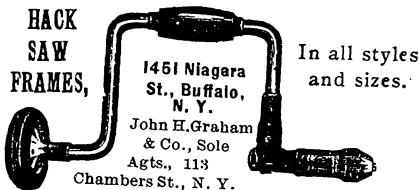
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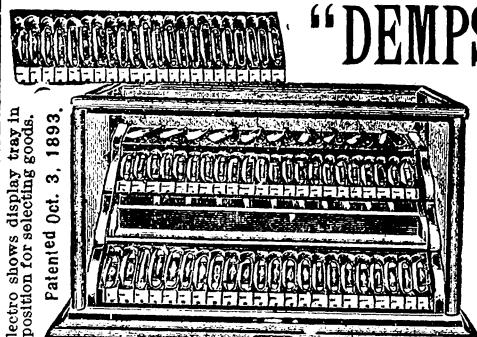
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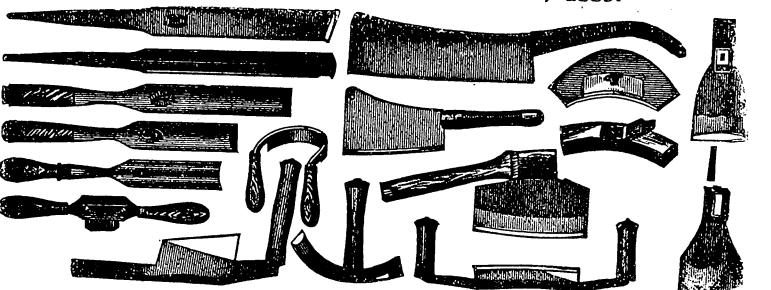
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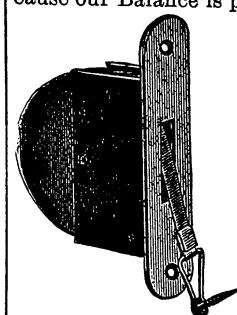
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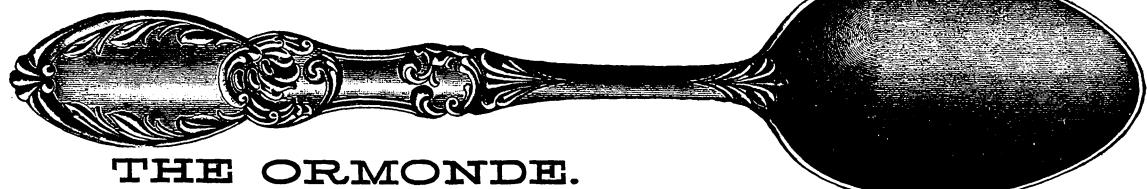
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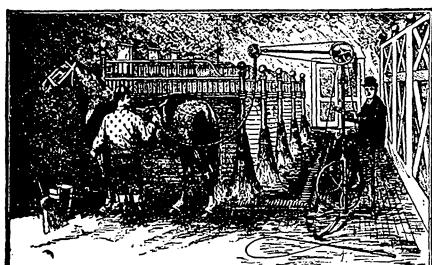
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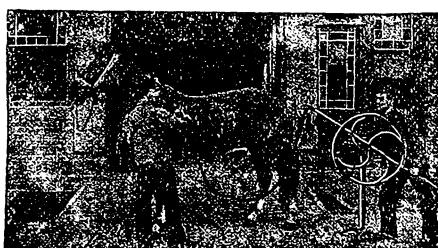


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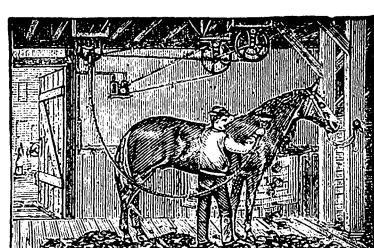
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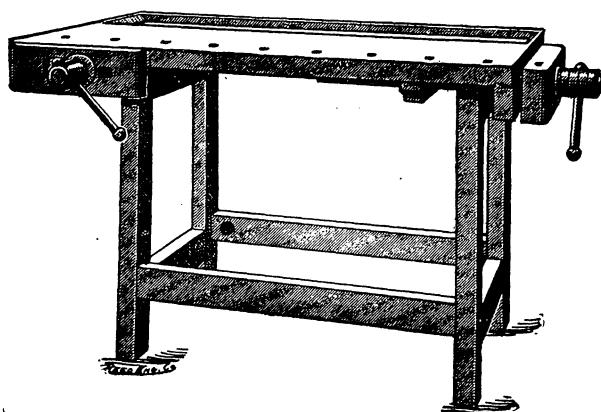
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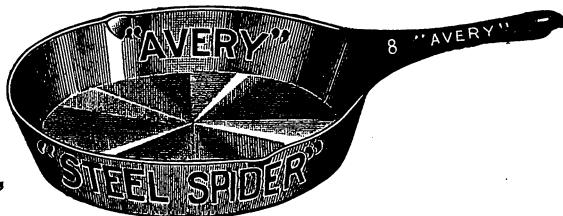
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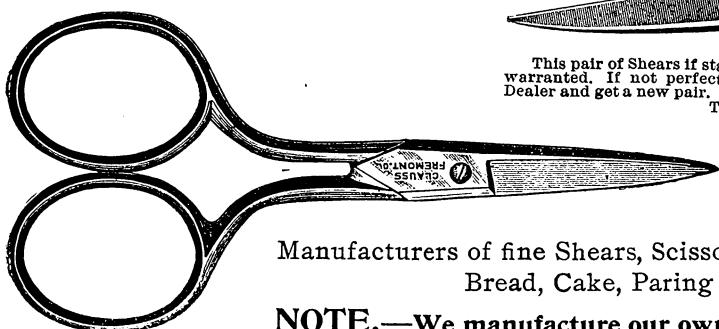
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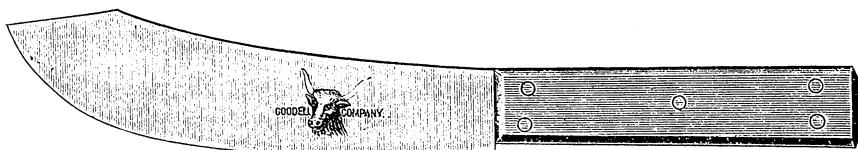
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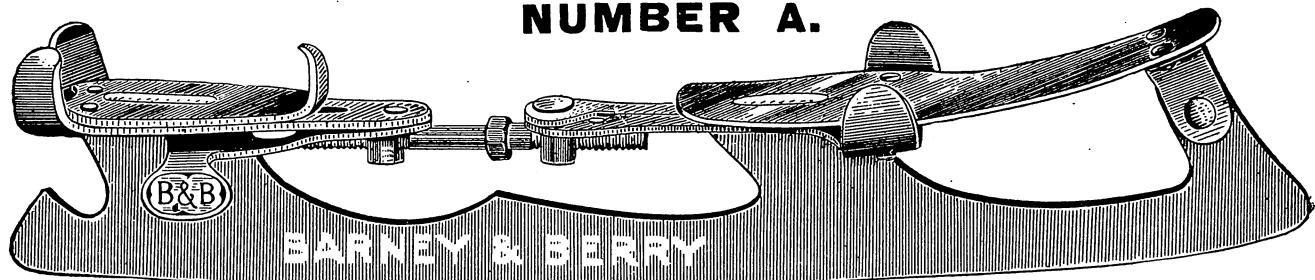
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THE IRON AGE STANDARD HARDWARE LISTS
FOR USE IN PRICE BOOKS.

Compiled by R. R. WILLIAMS, Hardware Editor of The Iron Age.

This pamphlet contains the principal standard Hardware price-lists in as clear and compact an arrangement as possible, so as to permit their being advantageously cut out and inserted in the price book. In order to make them adapted to this use they are printed on thin and tough paper of fine quality and on only one side of the paper.

Saucepans and Round Boilers.		The success of the effort to give the lists in small space is illustrated in many of the lists, in which a clear and condensed arrangement is secured. For instance, the wrench list occupies but 3 inches by $\frac{1}{4}$ inch, while the list of Stove Hollow Ware, in very small space, gives the list prices on a large and important line of goods which often occupy several pages in catalogues. In several lists, such as Strap and T Hinges and Butts, a new arrangement is adopted, which is regarded as presenting these lists in a very convenient as well as condensed form.						Stove Hollow Ware.		Ground and Unground.				
Pints.	Plain	Turned	Tin'd or En'd.					No.....	6	7	8	9	10	11
1	\$0.30	.35	.39					Pots.....	\$0.65	.75	.85	1.00	1.25	1.75
1 1/2	.32	.37	.44					Kettles.....	.55	.65	.70	.85	1.00	1.40
2	.35	.39	.48					T Kettles.....	.75	.80	.90	1.00	1.25	...
3	.42	.47	.56					Spiders.....	.27	.30	.35	.40	.50	.60
Quarts.								Griddles Round	.22	.25	.27	.30	...	...
2	.50	.56	.63					“ Long..	.40	.50	.60	.75	...	...
2 1/2	.53	.59	.68											
3	.55	.62	.73											
4	.60	.68	.84											
5	.65	.75	.96											
6	.70	.81	1.11											
7	.75	.84	1.21											
Gallons.														
2	.85	.96	1.31											
2 1/2	1.05	1.18	1.56											
3	1.20	1.35	1.70											

As is obvious from the lists herewith reproduced, the shape and size of the different lists varies greatly, the aim being to give each list the smallest and most convenient arrangement possible. None of the lists are, however, more than $3\frac{1}{2}$ x 6 inches in size, very few of them being as large as this and most of them very much smaller. In use it is intended that they shall be trimmed closely before they are inserted in price books, when they may be attached either by one edge close to the hinge of the book, as will, perhaps, be most convenient with the larger lists, permitting the use of the entire page for memoranda, or the smaller lists may be pasted on the page in connection with the entries in regard to discounts, freights, &c. Many of the lists are so compact in arrangement as when thus inserted to leave ample room for recording quotations.

Wrenches. Standard List.								Some merchants use this pamphlet for reference, checking off invoices, etc., as it gives the leading lists in a more convenient form than they can otherwise be obtained. The lists are, however, intended primarily to be cut out and inserted in price books, and can be used in connection with any of The Iron Age Hardware Price Books.						Glue Pots. Tin'd or Enamel'd			
Inches.	6	8	10	12	15	18	21	No 4/0....	\$4.50	No 2....	\$8.40			No 3/0....	5.00	3	10.26
Black...	\$9.00	\$10.00	\$12.00	\$14.00	\$24.00	\$30.00	\$36.00	3/0....		4				2/0....	5.50	4	12.42
Bright..	10.00	11.00	14.00	16.00	26.00	32.00	38.00	0		6				1	6.00	5	14.58

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Are Built to Create Business.
Are Built to Please Business men
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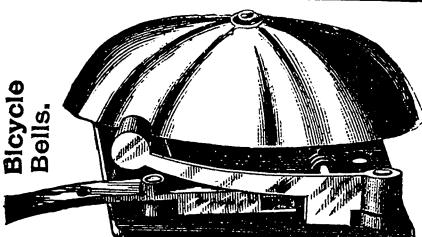
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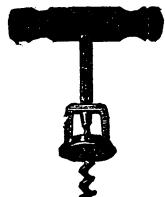
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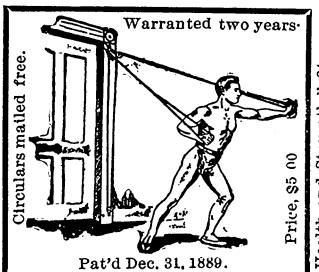
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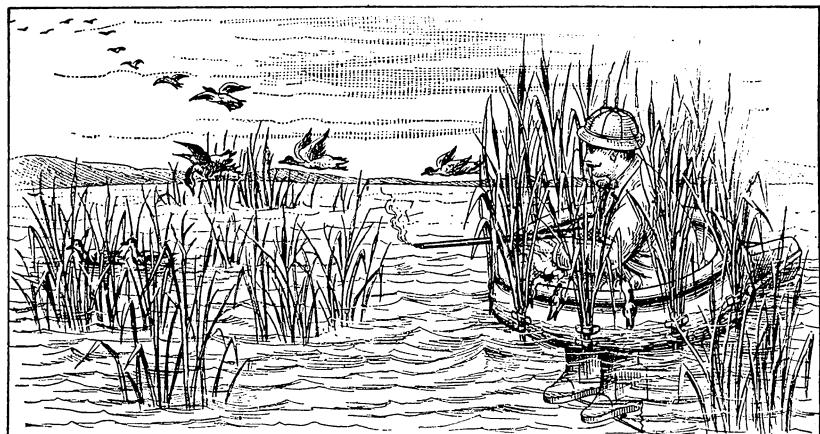
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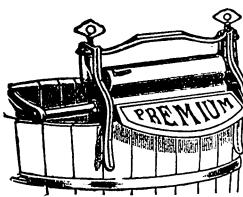
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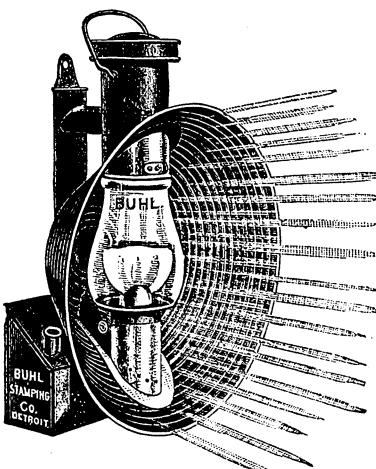


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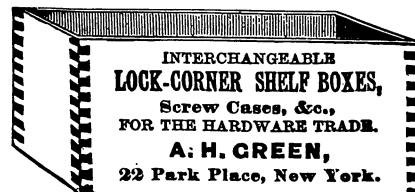
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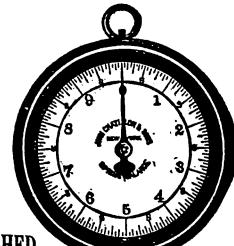
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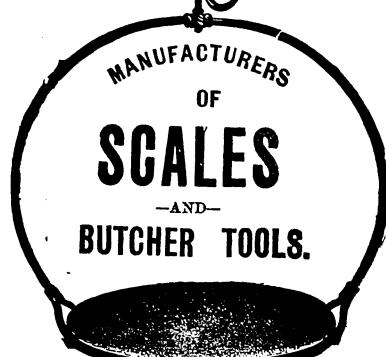
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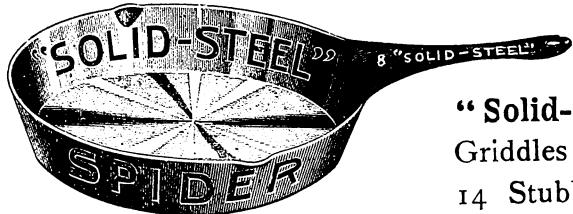


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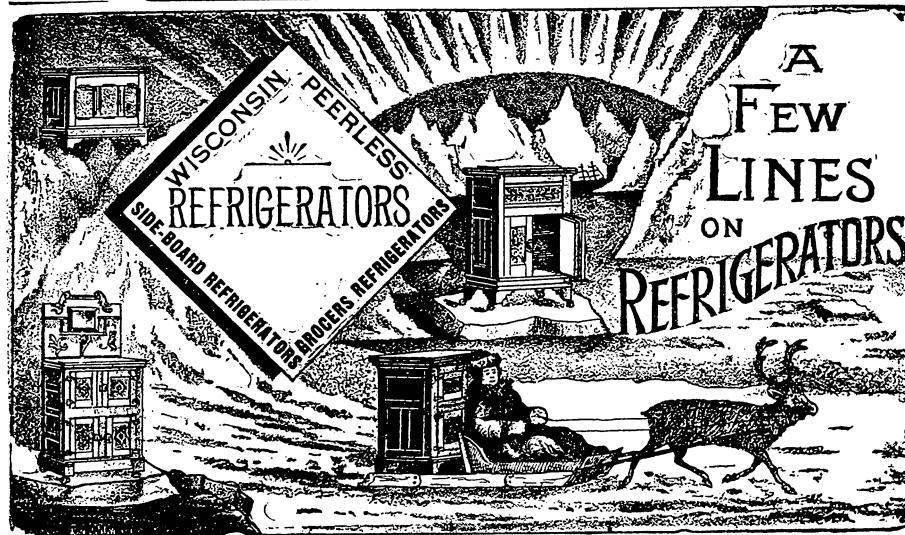
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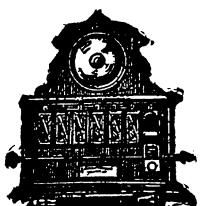
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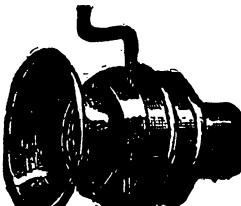
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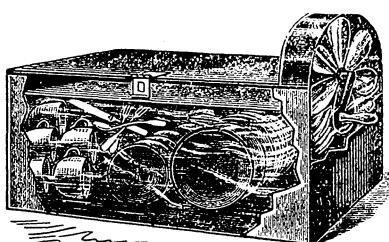
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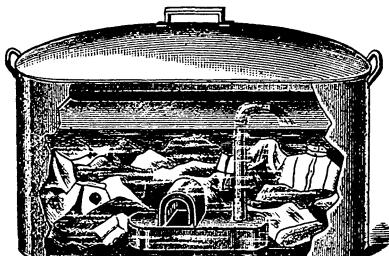
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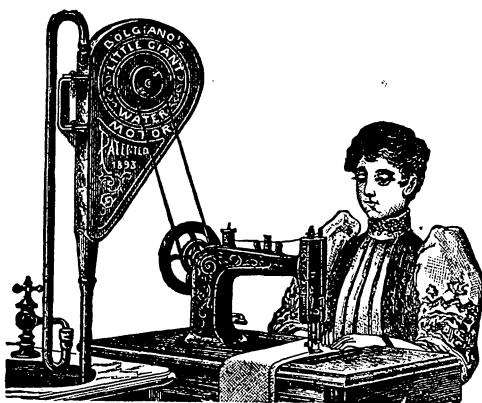
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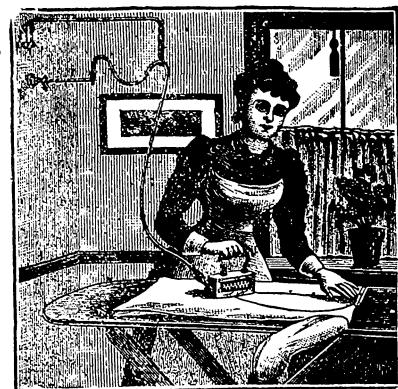
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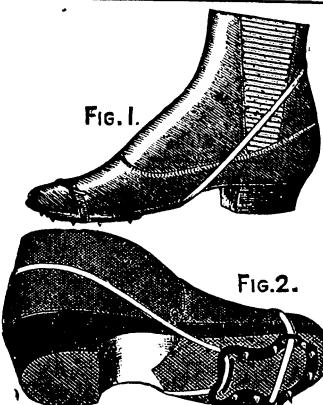


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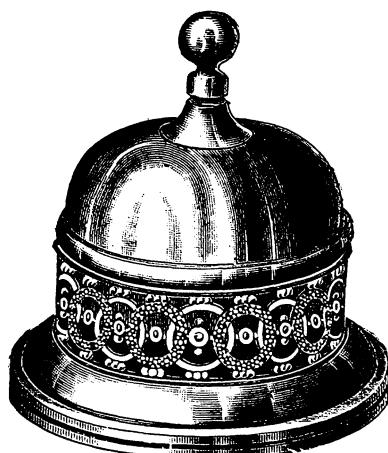
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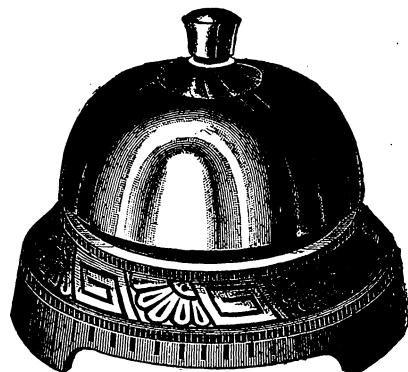
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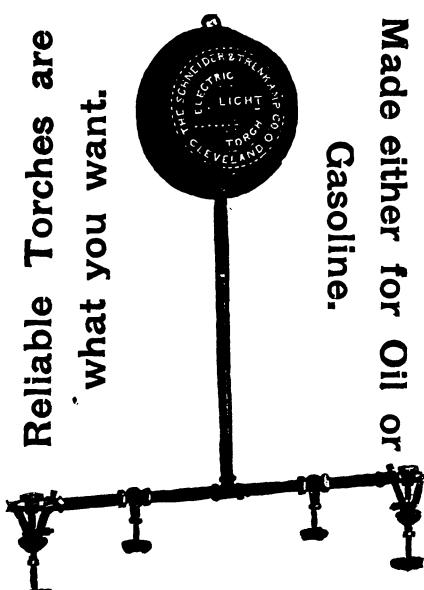
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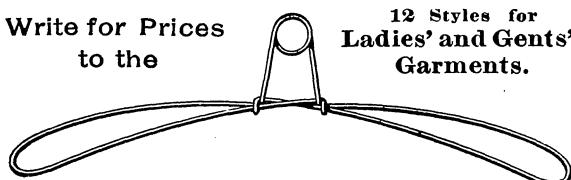
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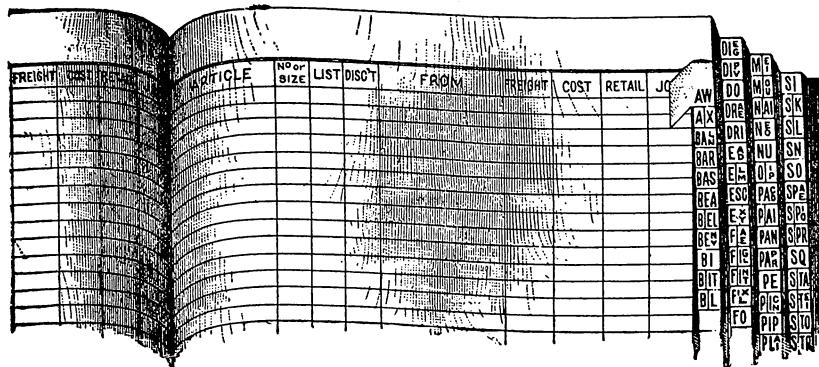
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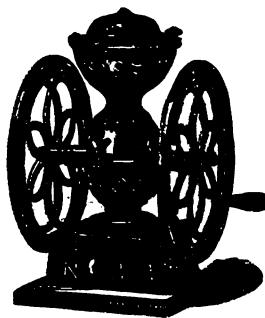
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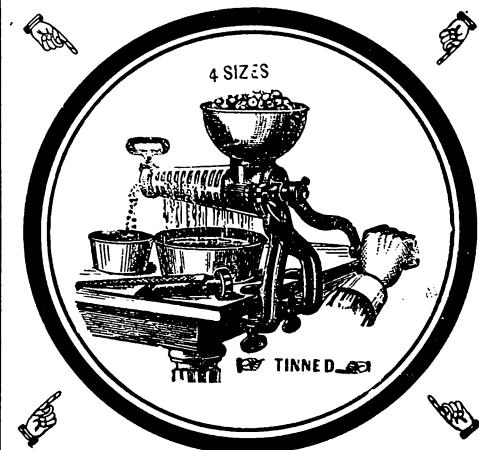
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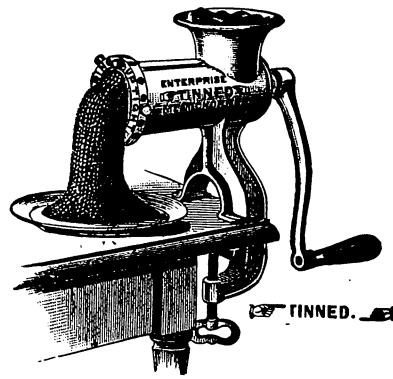
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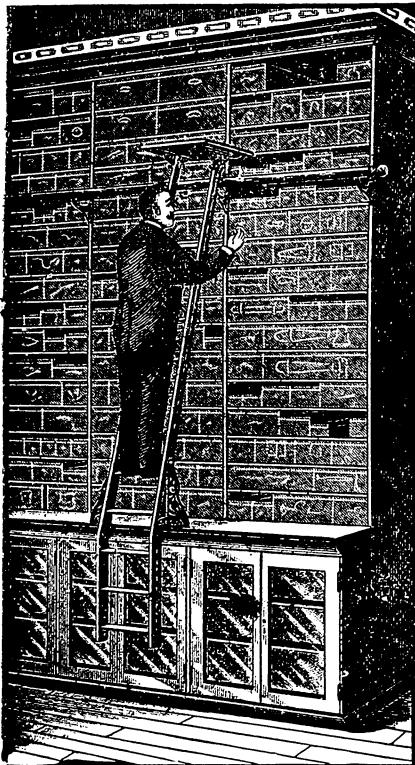


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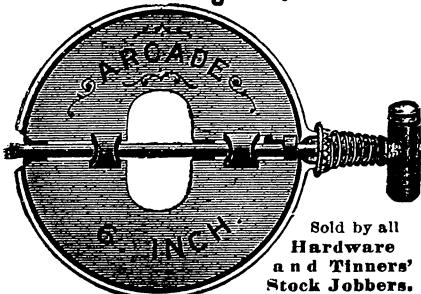
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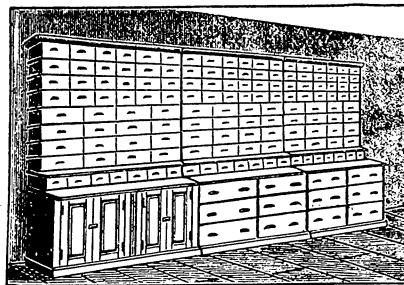


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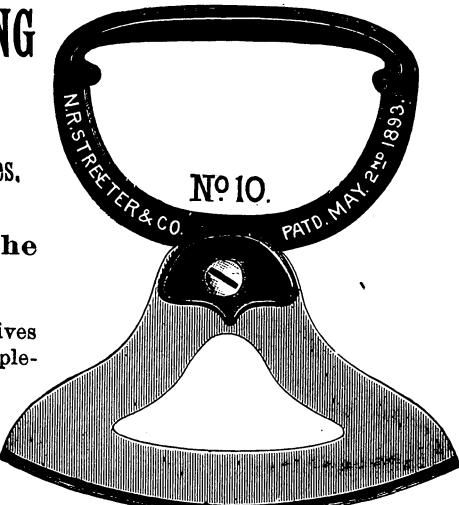
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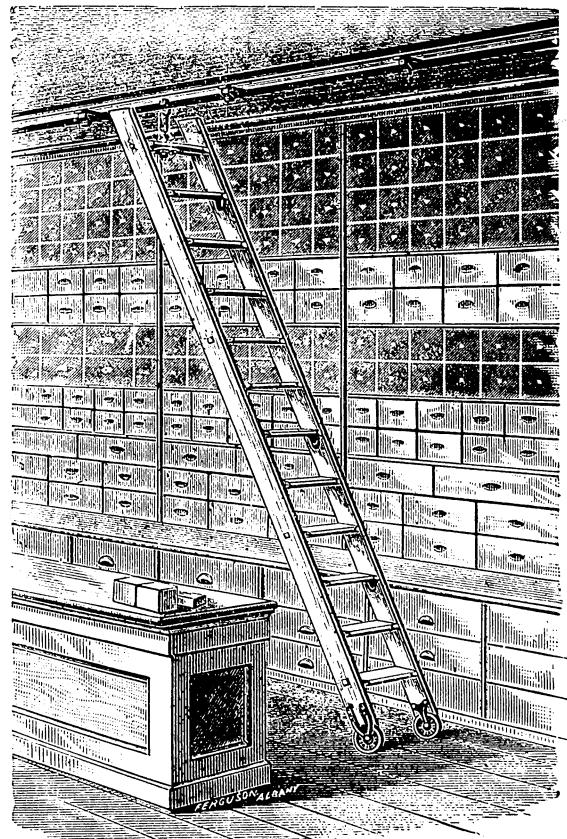
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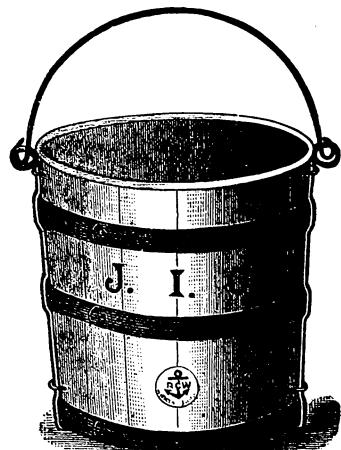
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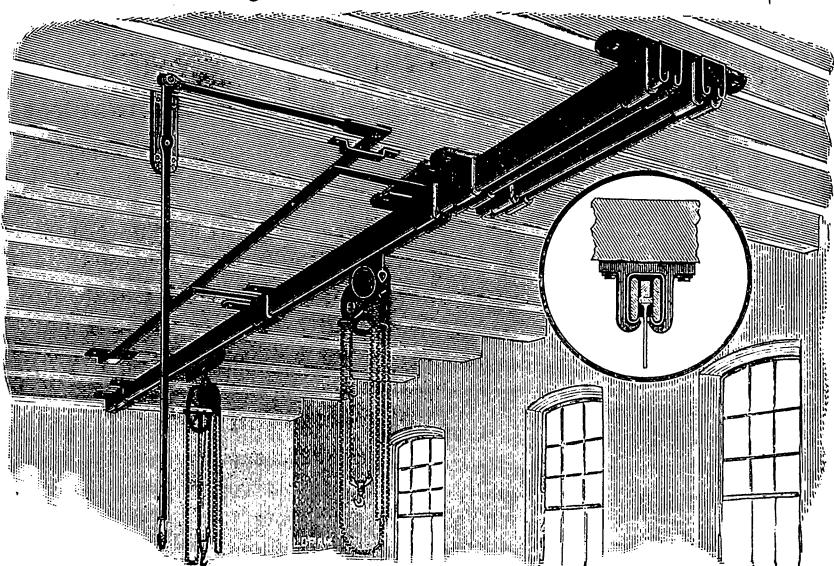
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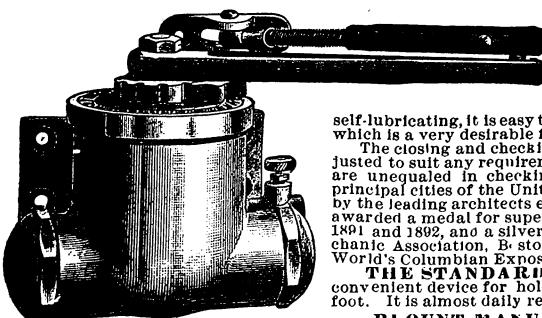
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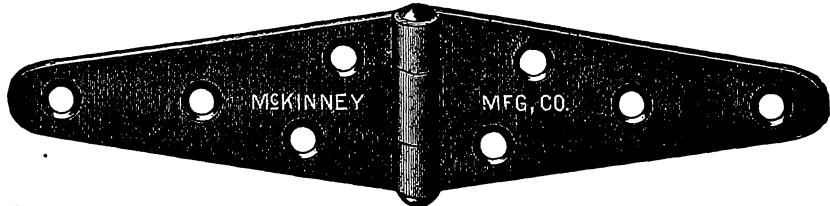
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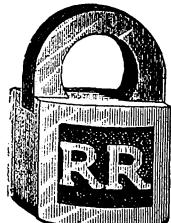
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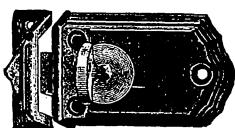
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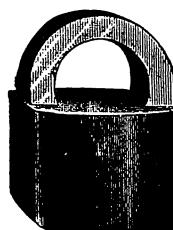


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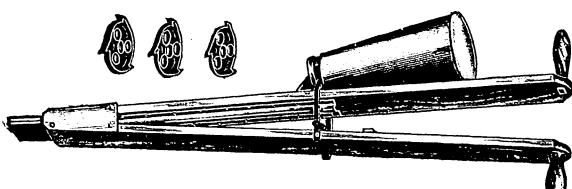
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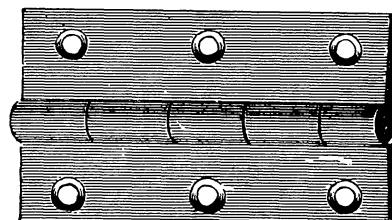
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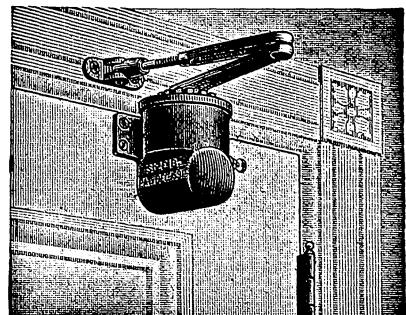
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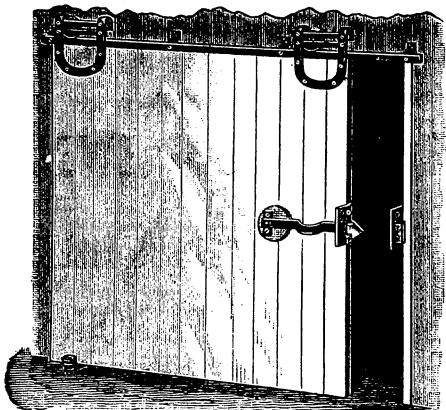
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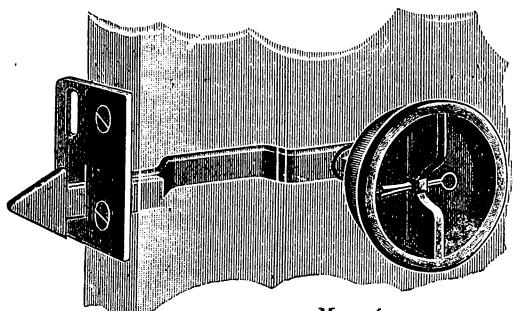
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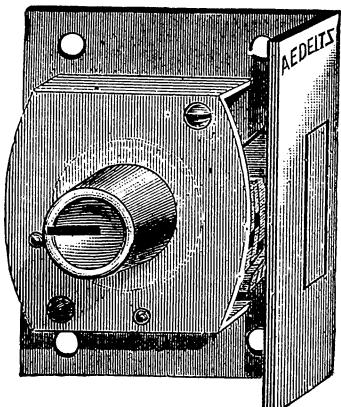


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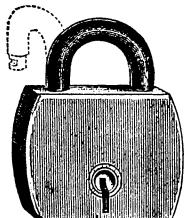
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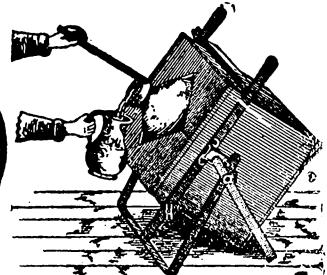
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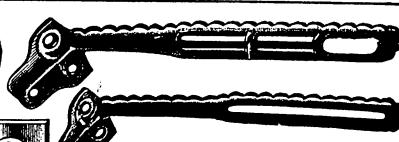
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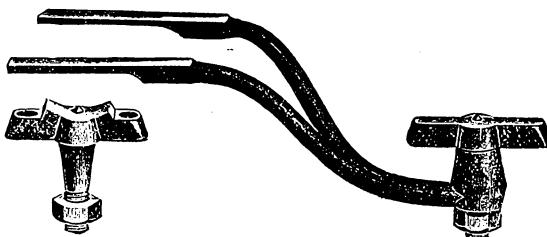


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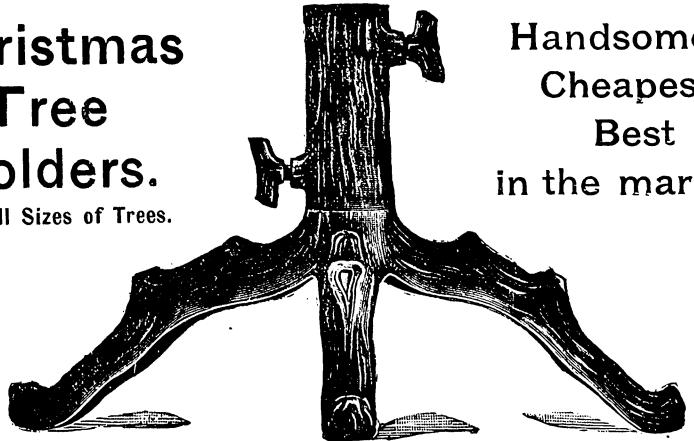
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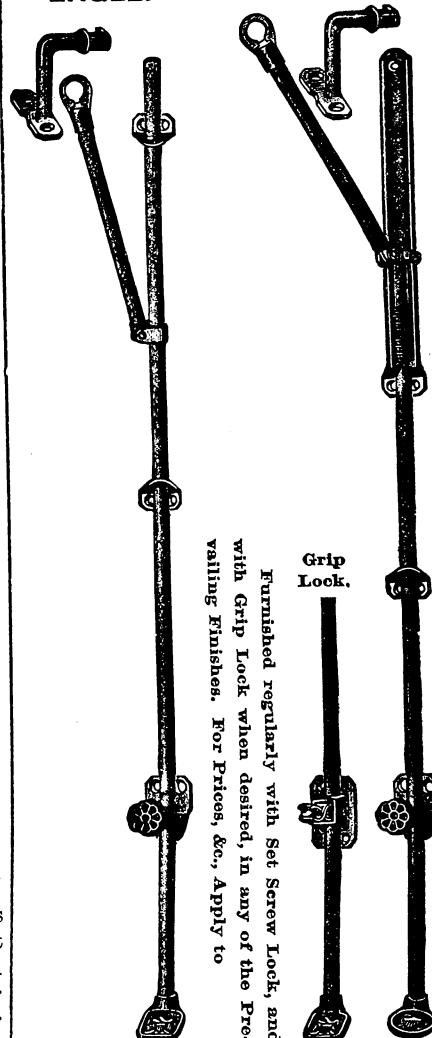


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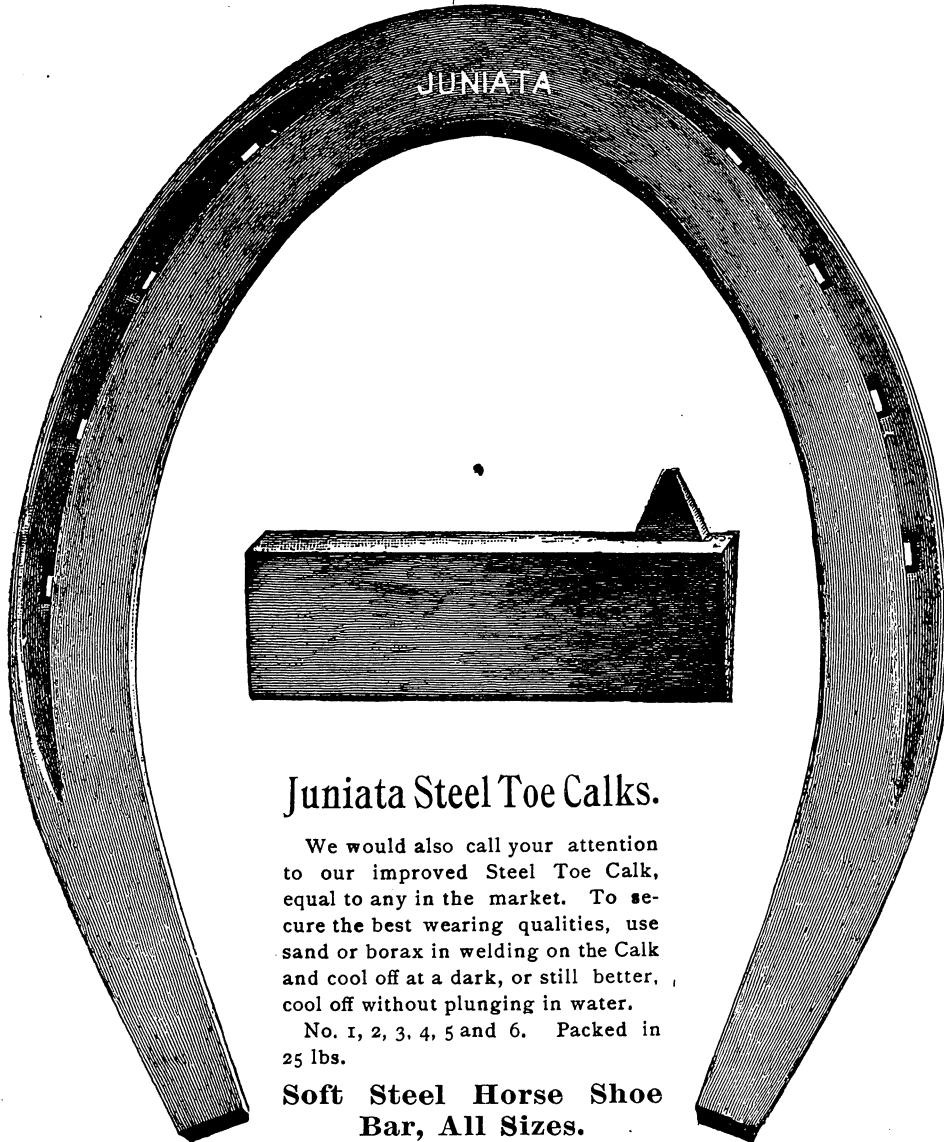
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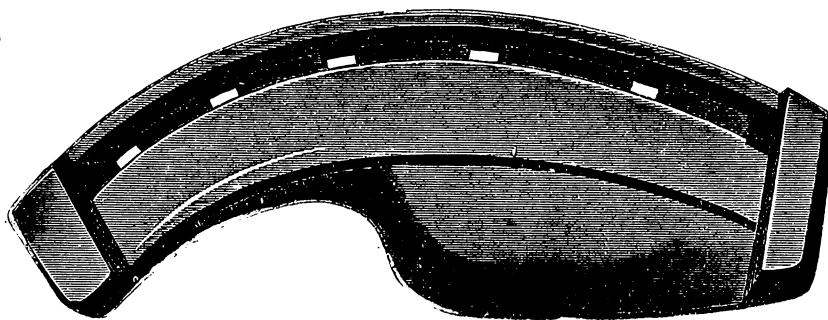
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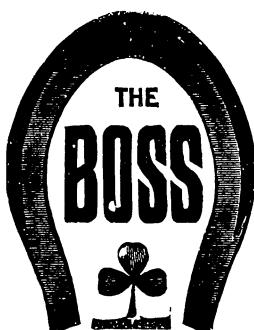
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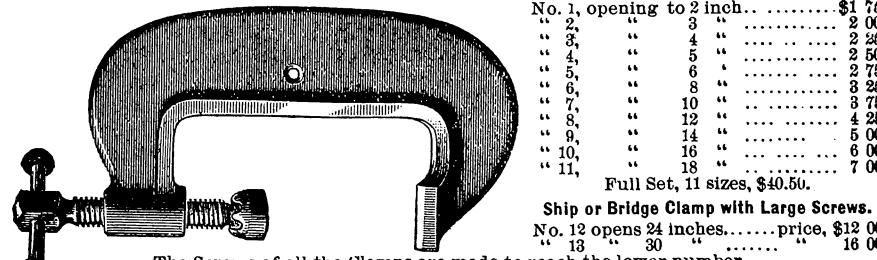
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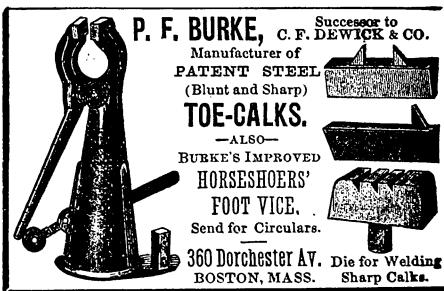
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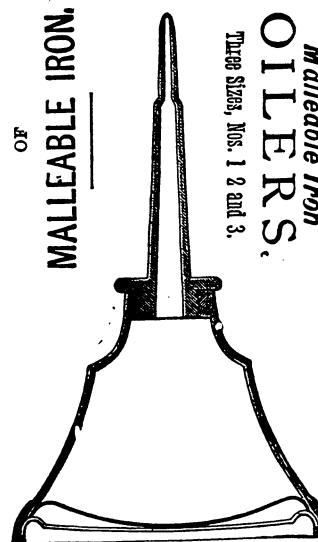
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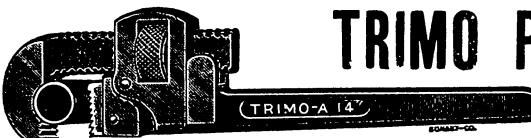
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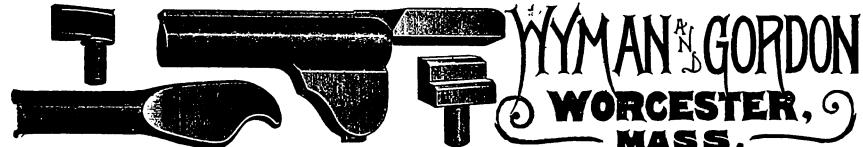
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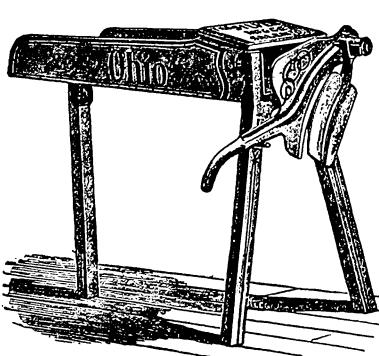


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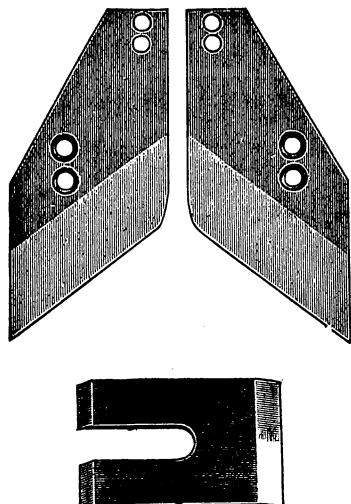
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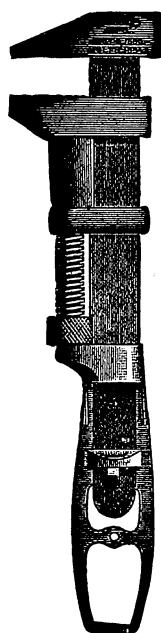
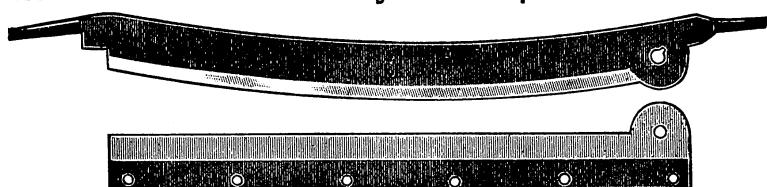


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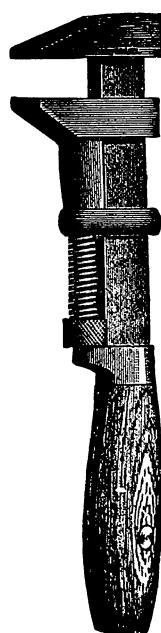
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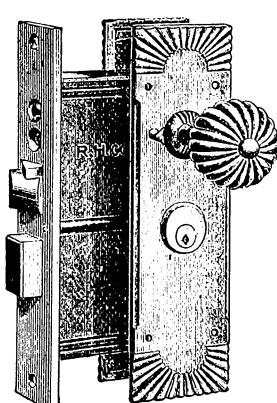
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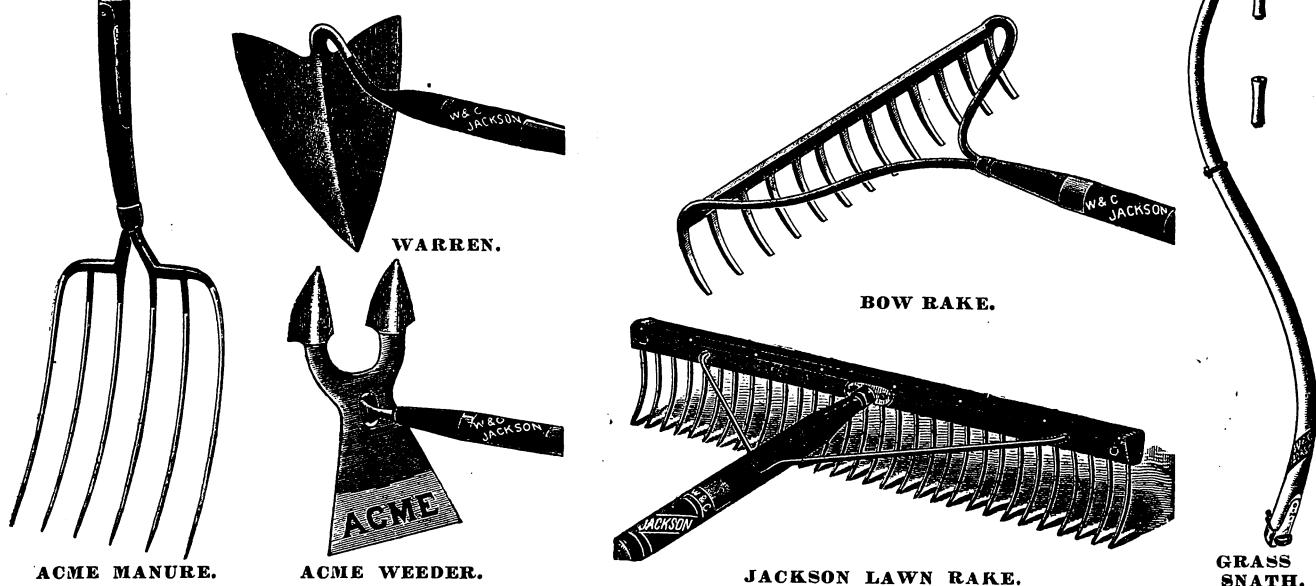
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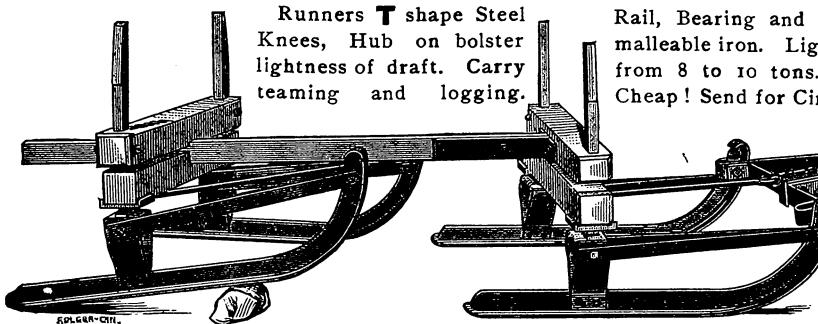
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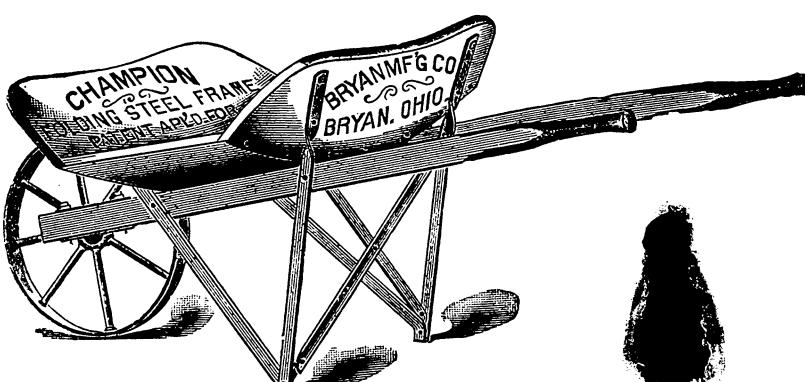
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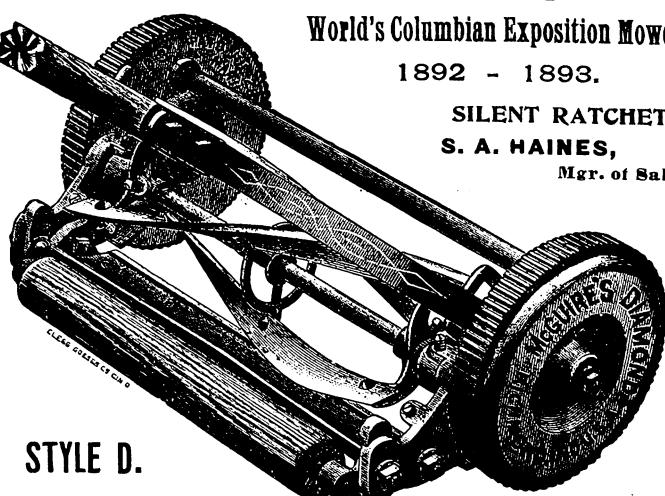
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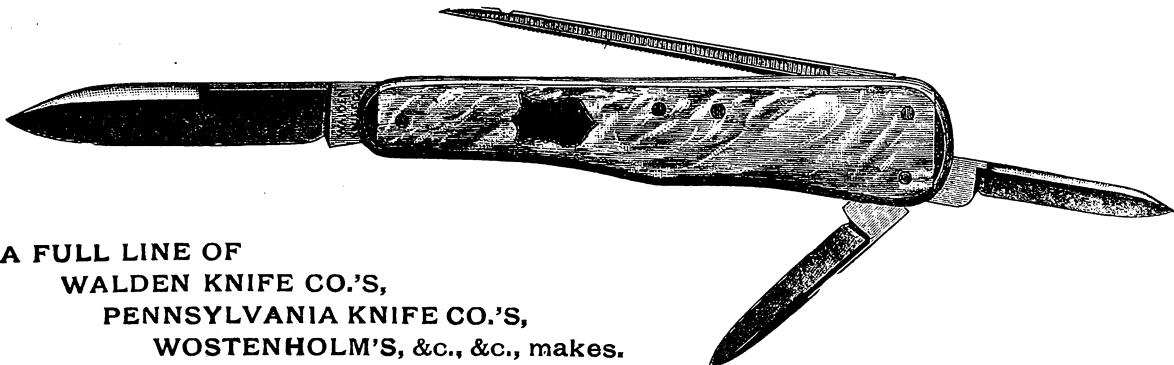
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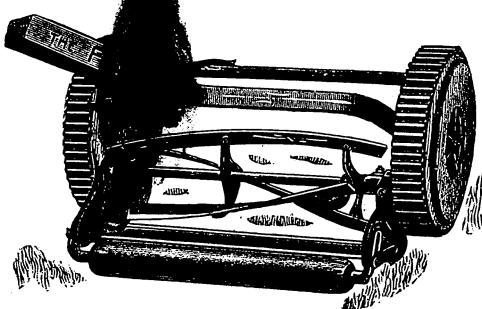
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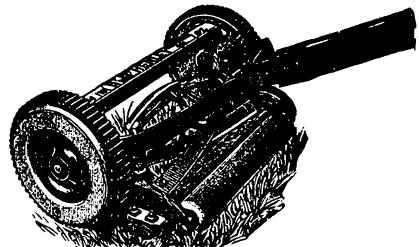
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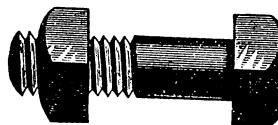
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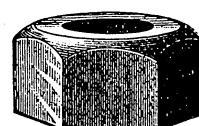
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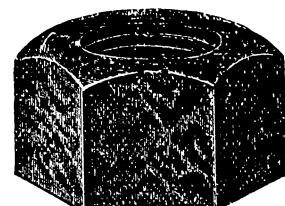


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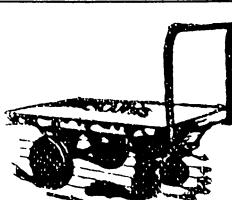
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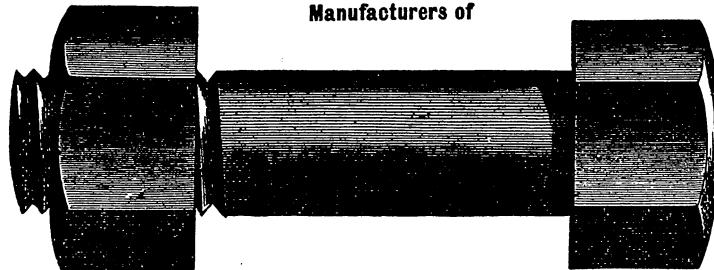


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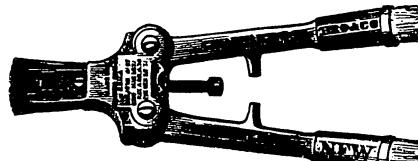
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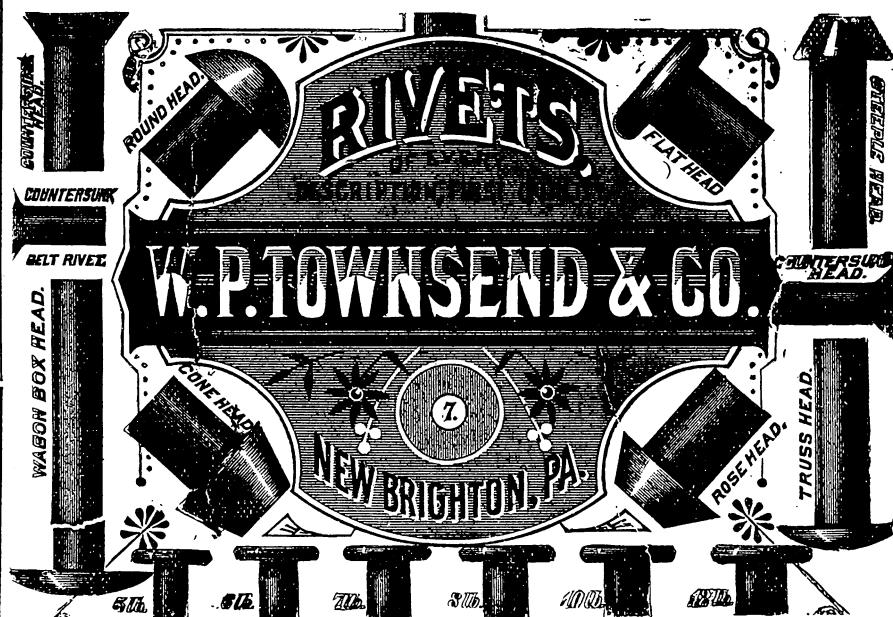
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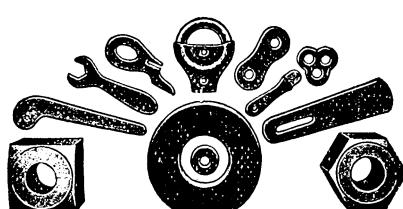


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Peck, A. G. & Co., Cohoes, N. Y.

Axe Wedges.

Sawyer Hdw. & Supply Co., Pawtucket, R. I.

Axles, Springs, &c., Manufacturers of.

Gautier Steel Dept. of Cambria Iron Co., Johnstown, Pa.

Wurster, F. W. & Co., Brooklyn, N. Y.

Babbitt Metal.

Bridgeport Deoxidized Bronze and Metal Co., Bridgeport, Conn.

Crown Smelting Co., Chester, Pa.

Hertz, J. & Son, St. Louis, Mo.

Keys, W. W. & R. M. Co., Bridgeport, Conn.

Reeves, Paul S., Philadelphia, Pa.

Bale Ties.

Kilmer Mfg. Co., Newburg, N. Y.

Barb Wire and Fence.

Cincinnati Barb Wire Fence Co., Cincinnati, O.

Gautier Steel Dept. of Cambria Iron Co., Johnstown, Pa.

Indiana Wire Fence Co., Crawfordsville, Ind.

Kilmer Mfg. Co., Newburg, N. Y.

Ludlow-Saylor Wire Co., St. Louis, Mo.

Washburn & Moen Mfg. Co., Worcester.

Bar Iron, Manufacturers of.

Aetna-Standard Iron & Steel Co., Bridgeport, Ohio.

Allentown Rolling Mill, Allentown, Pa.

Burden Iron Co., Troy, N. Y.

Crescent Horse Shoe & Iron Co., Max Meadows, Va.

Montour Iron & Steel Co., Danville, Pa.

Mahoning Valley Iron Co., Youngstown, Ohio.

Sternbergh, J. H. & Son, Reading, Pa.

Barrel Openers.

Am. Specialty Co., Hartford, Conn.

Bellows, Manufacturers of.

Scott, Geo. M., Chicago, Ill.

Bells.

Bevin Bros. Mfg. Co., East Hampton, Graham, Jno. H. & Co., 113 Chambers St., N. Y.

Belt Dressing.

Jos. Dixon Crucible Co., Jersey City, N. J.

Belt Fasteners.

Bristol Co., Waterbury, Conn.

Claffey Mfg. Co., Cleveland, Ohio.

Sawyer Hdw. & Supply Co., Pawtucket, R. I.

Talcott, W. O., Providence, R. I.

Belt Makers of.

Alexander Bros., 412 Cliff St., N. Y.

Jeffrey Mfg. Co., Columbus, O.

Link-Belt Engineering Co., Phila., Pa.

Main Beltaving Co., Philadelphia, Pa.

N. Y. Belting & Packing Co., Ltd., N. Y.

Roberts Mfg. Co., Pittsburgh, Pa.

Shultz Belting Co., St. Louis, Mo.

Bicycle Parts.

New Britain Hdw. Mfg. Co., New Britain, Conn.

Bicycles.

Crawford Mfg. Co., Hagerstown, Md.

Eagle Bicycle Mfg. Co., Torrington, Ct.

Grand Rapids Cycle Co., Grand Rapids, Mich.

Kearing Wheel Co., Holyoke, Mass.

League Cycle Co., Hartford, Conn.

Lovell, Jno. P. Arms Co., Boston, Mass.

Pope Mfg. Co., Boston, Mass.

Read, Wm. & Sons, Boston, Mass.

Bicycle Spokes.

Excelsior Needle Co., Torrington, Ct.

Bicycle Sundries.

Bevin Bros. Mfg. Co., E. Hampton, Mass.

Bit Braces.

Amidon Tool Corp., Buffalo, N. Y.

Blocks, Tackle, Makers of.

Cleveland Block Co., Cleveland, O.

Fulton Iron & Engine Works, Detroit, Mich.

Boats, Sporting.

American Rubber Boat Co., N. Y.

Boiler Plates.

Carbon Steel Co., Pittsburgh, Pa.

McIlvain, Wm. & Sons, Reading, Pa.

Lukens Iron & Steel Co., Coatesville, Pa.

Pottstown Iron Co., Pottstown, Pa.

Boilers, Copper.

Randolph & Clowes, Waterbury, Conn.

Boilers, Steam.

Babcock & Wilcox Co., 30 Cortlandt St., Collins, H. E. & Co., Pittsburgh, Pa.

Harrison-Safety Boiler Wks., Phila., Pa.

Pollack, W. B. & Co., Youngstown, O.

Porter, H. K., Boston, Mass.

Southwick Fdy. & Mfg. Co., Phila., Pa.

Sterling Co., Chicago, Ill.

Wetherill, Robert & Co., Chester, Pa.

Wilcox, Crittenden & Co., Middletown, Conn.

Bolt Cutters.

Chambers Bros. Co., Philadelphia.

Howard Iron Works, Buffalo, N. Y.

Wells Bros. & Co., Greenfield, Mass.

Books.

Republic Press, 14 Lafayette Place, N. Y.

Williams, David, 96-102 Reade, N. Y.

Boring Machines.

Buckeye Mfg. Co., Union City, Ind.

Box Banders.

Goodell, J. W., Burlington, Vt.

Boxes, Hdw. Shelf, &c.

Green, A. H., 22 Park Place, N. Y.

Jones, Jesse & Co., Philadelphia, Pa.

Brass, Manufacturers of.

Ansonia Brass & Copper Co., N. Y.

Davol, John & Sons, 100 John St., N. Y.

Plume & Atwood Mfg. Co., N. Y.

Randolph & Clowes, Waterbury, Conn.

Rome Brass & Copper Co., Rome, N. Y.

Scovill Mfg. Co., Waterbury, Conn.

Waterbury Brass Co., 296 Broadway, N. Y.

Brass Butt Hinges.

Tiebout, W. J., 16 & 18 Chambers.

Brass Founders.

Cramp, Wm. & Sons S. & E. B. Co., Philadelphia, Pa.

Eynon-Evans Mfg. Co., Philadelphia, Pa.

Brass Goods.

Brass Goods Mfg. Co., 88 Chambers.

Bread and Cake Knives.

Clauss Shear Co., Fremont, O.

Bronze (Tobin).

Ansonia Bronze & Copper Co., 19-21 Cliff Street, N. Y.

Bridgeport Deoxidized Bronze & Metal Co., Bridgeport, Conn.

Brooms and Brushes.

Rice Mfg. Co., New Durham, N. H.

Builders' Hardware.

Delitz, A. E., 97 Chambers St., N. Y.

Reading Hdw. Co., Reading, Pa.

South, W. A. Co., Salem, Mass.

Yale & Towne Mfg. Co., Stamford, Ct.

Burr Wheels.

Torrance Iron Co., Troy, N. Y.

Butchers' Steels.

Chatillon, John & Sons, 85-89 Cliff St., N. Y.

Butcher and Shoe Knives, Manufacturers of.

Chatillon, John & Sons, 85-89 Cliff St., N. Y.

Goodell, Antrim, N. H.

Wilson, John, Sheffield, England.

Butts and Hinges.

McKinney Mfg. Co., Allegheny, Pa.

Sabin Machine Co., Montpelier, Vt.

Stanley Works, New Britain, Conn.

Tiebout, W. J., 16 Chambers, N. Y.

Wrightsville Hdw. Co., Wrightsville, Pa.

Cabinet Benches.

Grand Rapids Hand Screw Co., Grand Rapids, Mich.

Calipers and Dividers.

J. Stevens Arms and Tool Co., Chicopee Falls, Mass.

Starrett, L. S., Athol, Mass.

Car Axles.

Roberts, A. & P. & Co., Phila.

Carboy Stands.

Wolf, W. L., Philadelphia, Pa.

Carriage Hardware, Makers of.

Clapp, E. D. Mfg. Co., Auburn, N. Y.

Covert's Saddlery Works, Farmer, N. Y.

Eccles, Richard, Auburn, N. Y.

Scranton Forging Co., Scranton, Pa.

Smith, H. D. & Co., Plantsville, Conn.

Wilcox & Howe, Birmingham, Conn.

Cartridge Reloading Tools.

Link Mfg. Co., New Haven, Conn.

Carvers' Tools.

White, Van Glahn & Co., 15-17 Chat-

ham Square, N. Y.

Casters, Wheel, &c.

Clark, G. P., Windsor Locks, Conn.

Castings, Iron and Steel.

Allentown Hdw. Wks., Allentown, Pa.

Booth, The Lloyd Hdw. Co., Youngstown, O.

Boston Casting Co., So. Boston, Mass.

The Burr & Houston Co., Brooklyn, N. Y.

Cheney, S. & Son, Manlius, N. Y.

Chester Steel Casting Co., Phila., Pa.

Chrome Steel Works, Brooklyn, N. Y.

Eureka Cast Steel Co., Chester, Pa.

Flagg, Stanley G. & Co., Phila.

Gartland Foundry Co., Cleveland, O.

Haight & Clark, Albany, N. Y.

Palmer & De Moor Fdy. Co., Cleve-

land, O.

Parsons, R. E. Co., Bridgeport, Conn.

Pratt & Cady Co., Hartford, Conn.

Sessions Foundry Co., Bristol, Conn.

Shickle, Harrison & Howard Iron Co., St. Louis, Mo.

Spencer I. S. Sons, Guilder, Conn.

Standard Fdy. & Mfg. Co., Cleveland, O.

Torrance Iron Co., Troy, N. Y.

Union Lock & Hdw. Co., Lancaster, Pa.

Walker Mfg. Co., Cleveland, Ohio.

Wetherill, Robert & Co., Chester, Pa.

Wilcox, Crittenden & Co., Middletown, Conn.

Castings, Malleable.

Arcade Malleable Iron Co., Worcester, Mass.

Hammer & Co., Branford, Conn.

Torrence Iron Co., Troy, N. Y.

Catalogue Files.

Folding Paper Box Co., So. Bend, Ind.

Chains.

Bradley & Co., Philadelphia.

Gartland Chain Co., Rankin, Pa.

Link Belt Engineering Co., Phila., Pa.

McKay, Jas. & Co., Pittsburgh, Pa.

McKitt, Jas. & Co., Buffalo, N. Y.

Check Punch.

Hoggson & Pettis Mfg. Co., New Haven, Conn.

Chimneys.

Phila. Engineering Works, Phila., Pa.

Chisels, Manufacturers of.

Buck Bros., Milbury, Mass.

Buck, Chas., Milbury, Mass.

White

Place, Geo., 145 Broadway, N. Y.
Pond, L. W. Mch. Co., Worcester, Mass.
Poole, Robt. & Son Co., Baltimore, Md.
Powell Planer Co., Worcester, Mass.
Prentiss Tool & Supply Co., N. Y.
Scranton Supply & Mchry. Co., Scranton, Pa.
Sellers, Wm. & Co., Phila.
Seyfert's Sons, L. F., Philadelphia, Pa.
Sigourney Tool Co., Hartford, Conn.
Steptoe, J. & Co., Cincinnati, O.
Stow Flexible Shaft Co., Ltd., Phila.
Toomey, Frank, Philadelphia, Pa.
Walker Mfg. Co., Cleveland, O.
Wetherill, Robert & Co., Chester, Pa.
Wilson, W. A., Rochester, N. Y.

Machinery for Hardware Manufacturers.
Adt, Jno. & Son, New Haven, Conn.

Machine Knives.
Loring, Coes & Co., Worcester, Mass.
Simonds Mfg. Co., Fitchburg, Mass.

Machine Screws.
American Iron & Bolt Co., Cincinnati, Ohio.
Hubbell, Harvey, Bridgeport, Ct.
New Britain Hdw. Mfg. Co., New Britain, Conn.
Rhode Island Tool Co., Providence, R. I.

Machine Tools.—See *Machinery*.

Machine Work.
Papping, J., 58th St. & 11th Ave., N. Y. City.

Machinists' Scales.
Coffin & Leighton, Syracuse, N. Y.
Starrett, L. S., Athol, Mass.

Machinists' Tools and Supplies.
King, J. M. & Co., Waterford, N. Y.
Sellers, Wm. & Co., Inc., Phila.

Manufacturing Sites.
Chicago, Milwaukee & St. Paul R. Chicago, Ill.

Measuring Tapes.
Lufkin Rule Co., Saginaw, Mich.

Meat Choppers.
Enterprise Mfg. Co., Philadelphia, Pa.

Meat Cutters.
North Bros. Mfg. Co., Philadelphia, Pa.

Mechanical Instruction.
Correspondence School of Mechanics, Scranton, Pa.

Metals.
Fearing, Wm. S., 100 Chambers, N. Y.
Hendricks Bros., 49 Cliff, N. Y.

Metal Brokers.
American Metal Co., N. Y.

Metal Saws.
Q. & C. Co., Chicago, Ill.

Metallurgists.
Britton, J. Blodgett, Phila., Pa.

Mincing Knives.
Palmer Hdw. Mfg. Co., Troy, N. Y.
Streeter, N. R. & Co., Groton, N. Y.

Mine Lamps.
Darby, Edw. & Sons, Phila., Pa.
Leonard, B. E., Scranton, Pa.

Mining Screens.
Harrington & King Perforating Co., Chicago, Ill.
Howard & Morse, 45 Fulton, N. Y.

Mining Machinery.
Ails, E. P. Co., Milwaukee, Wis.

Models, Makers of.
Ideal Machine Works, Hartford, Conn.

Molding Sand.
Obermayer, S. Co., Cincinnati, O.

Motors, Water and Electric.
Bolgianno Mfg. Co., Baltimore, Md.
C. & C. Electric Co., 402 and 404 Greenwich St., N. Y.
Dallett, Thomas H. & Co., Phila., Pa.

Nail Machinery.
Pittsburgh Mfg. Co., Pittsburgh, Pa.

Nail and Tack Pullers.
Am. Specialty Co., Hartford, Conn.
Scranton & Co., New Haven, Conn.

Nails (Cut) and Spikes.
Borden & Lovell, 70 West, N. Y.
Pottstown Iron Co., Pottstown, Pa.
Riverside Iron Wks., Wheeling, W. Va.

Norway Shapes, Rollers of.
Rowland, William & Harvey, Frankford, Philadelphia.

Novelty Manufacturers.
Ideal Machine Works, Hartford, Conn.

Nut Machines.
Dunham Nut Co., Unionville, Ct.

Nuts, Bolts, &c., Makers of.
American Bolt Co., Lowell, Mass.
American Iron & Bolt Co., Cincinnati, Ohio.
American Screw Co., Providence, R. I.
Blake & Johnson, Waterbury, Conn.
Dunham Nut Co., Unionville, Conn.
Haskell, Wm. H. Co., Pawtucket, R. I.
Mt. Carmel Bolt Co., Mt. Carmel, Conn.
Pennsylvania Bolt & Nut Co., Lebanon, Pa.
Port Chester Bolt & Nut Co., Port Chester, N. Y.
Rhode Island Tool Co., Providence, R. I.
Russell, Burdsall & Ward, Port Chester, N. Y.
Sternbergh, J. H. & Son, Reading, Pa.
Wilson, J. Fred., Worcester, Mass.
Wm. H. Haskell Co., Pawtucket, R. I.

Oilers.
Wilmot & Hobbs Mfg. Co., Bridgeport, Conn.

Oilless Anti-Friction Metals.
North American Metalline Co., Long Island City, N. Y.

Oil Stones.
Pike Mfg. Co., Pike Station, N. H.

Ores.
Wister, Francis, Philadelphia, Pa.

Oil Shoes.
Scranton Forging Co., Scranton, Pa.

Packing.
Morrison, Robert, St. Louis, Mo.
N. Y. Belting & Packing Co., Ltd., N. Y.

Padlocks.
Ames Sword Co., Chicopee, Mass.
Fraim, E. T., Lancaster, Pa.
Union Lock & Hdw. Co., Lancaster, Pa.
Wolt, W. & L., Phila., Pa.

Pails.
Richmond Cedar Wks., Richmond, Va.

Paint Burners.
Dangler Stove & Mfg. Co., Cleveland, Ohio.

Paint Cans.
Wilmot & Hobbs Mfg. Co., Bridgeport, Conn.

Pants Stretcher.
Covert Mfg. Co., West Troy, N. Y.

Patent Solicitors.
Butler, C. N., Phila., Pa.
Jenner, H. W. T., Washington, D. C.
Houston & Howson, Philadelphia and Washington.
Stocking, E. B., Washington, D. C.

Pattern Letters.
Wells, Heber, 157 William St., N. Y.

Perforated Metal.
Clinton Wire Cloth Co., Clinton, Mass.
Harrington & King Perforating Co., Chicago, Ill.
Hendrick Mfg. Co., Ltd., Carbondale, Pa.

Phosphor Bronze.
Phosphor Bronze Smelting Co., Limited, Philadelphia.

Phosphor Tin.
Crescent Phosphorized Metal Co., Philadelphia, Pa.
Halk & Naumann, 516 Pearl, N. Y.

Pig Iron.
Houston, C. B. & Co., Philadelphia, Pa.
Montour Iron & Steel Co., Danville, Pa.
Naylor & Co., 45 Wall, N. Y.
Pilling & Crane, Philadelphia, Pa.
Samuel, Frank, Philadelphia, Pa.

Pig Iron Storage.
Am. Pig Iron Storage Warrant Co., 44 Wall, N. Y.

Pile Drivers.
Vulcan Iron Works, Chicago, Ill

Pipe, Bent.
National Pipe Bending Co., New Haven, Conn.

Pipe Cutting and Threading Machines.
Armstrong Mfg. Co., Bridgeport, Conn.
Bignal & Keeler Mfg. Co., St. Louis, Mo.
Detrick & Harvey Mch. Co., Baltimore, Md.
Merrill Mfg. Co., Toledo, O.
Pancoast, Henry B. & Co., Phila.
Saunders' Sons, D., Yonkers, N. Y.
Walworth Mfg. Co., Boston, Mass.

Pipe Grips.
Prentiss Vise Co., 44 Barclay, N. Y.

Pipes, Fittings, &c., Makers of.
McNab & Harlin Mfg. Co., N. Y.

Pipe, Sewer.
Columbus Sewer Pipe Co., Columbus, Ohio

Pipe, Water and Gas. Makers of
Donaldson Iron Co., Emmaus, Pa.
Riverside Iron Works, Wheeling, W. Va.
Wood, R. D. & Co., Philadelphia, Pa.

Plane Irons. Manufacturers of.
Buck Bros., Millbury, Mass.
Buck, Chas., Millbury, Mass.

Planers.
Detrick & Harvey Mch. Co., Baltimore, Md.
New Haven Mfg. Co., New Haven, Conn.
Pond, L. W. Mch. Co., Worcester, Mass.
Powell Planer Co., Worcester, Mass.
Wilson, W. A., Worcester, Mass.

Planes, Manufacturers of.
Stanley Rule & Level Co., N. Y.

Plated Ware.
Boardman, L. & Son, New Haddam, Ct.
Holmes & Edwards Silver Co., Bridgeport, Conn.
Rogers, Wm. Mfg. Co., Hartford, Ct.

Plate, Iron and Steel, Mfrs. of.
Aetna Standard Iron & Steel Co., Bridgeport, O.
Lukens Iron & Steel Co., Coatesville, Pa.
Mahoning Valley Iron Co., Youngstown, Ohio.
Moorhead-McLean Co., Pittsburgh, Pa.
McIlvain & Sons, Reading, Pa.
Pottstown Iron Co., Pottstown, Pa.
Pottsville Iron & Steel Co., Pottsville, Pa.
Singer, Nimick & Co., Pittsburgh, Pa.
The Mahoning Valley Iron Co., Youngstown, O.
Wood, Alan Co., Philadelphia.

Plating, Nickel, Brass and Silver.
Wilmot & Hobbs Mfg. Co., Bridgeport, Conn.

Polishing Machines.
Watson & Stillman, 204 E. 43d, N. Y.

Post Hole Diggers.
Gibbs Mfg. Co., Canton, Onto.
Kohler, F. E. & Co., Canton, O.

Poultry Nettings.
Barnum, E. T., Detroit, Mich.
Gilbert & Bennett Mfg. Co., 42 Cliff St., N. Y.
N. J. Wire Cloth Co., Trenton, N. J.
"Silver Finish."
Tyler Wire Works Co., W. S., Cleveland, O.
Wright & Colton Wire Cloth Co., Worcester, Mass.

Powder.
Lafin & Rand Powder Co., 29 Murray, New York Powder Co., 62 Liberty St., N. Y.

Powder Hammers.
Deneolt & Eisenhardt, Philadelphia.
Dupont Mfg. Co., St. Johnsbury, Vt.
Jenkins & Lingel, Bellefonte, Pa.
Long & Allstatter Co., Hamilton, Ohio.
Miner & Peck Mfg. Co., New Haven Conn.
Scranton & Co., New Haven, Conn.

Power Transmitting Machinery.
Dodge Mfg. Co., Mishawaka, Ind.

Presses, Dies, &c.
E. W. Bliss Co., Brooklyn, N. Y.
Crosby, G. A. & Co., Chicago, Ill.
Stiles & Parker Press Co., Brooklyn, N. Y.
Waterbury Mch. Co., Waterbury Ct.

Presses, Power, Makers of.
Bliss, E. W. Co., Brooklyn, N. Y.
Marshall, E. J. Mch. Co., Waterbury, Ct.
Merriman, A. H., Meriden, Conn.
Waterbury Farrel Foundry & Machine Co., Waterbury, Conn.

Printing and Embossing.
Griffith, Axtell & Cady Co., Holyoke, Mass.

Pruners.
Topliff & Ely Co., Elyria, Ohio.

Pulleys.
Brown, A. & F., 17 Dey St., N. Y.
Dodge Mfg. Co., Mishawaka, Ind.
Keystone Clutch Mch. Wks., Phila., Pa.
Reading Wood Pulley Co., Reading, Pa.

Pumping Machinery.
Dean Bros. Steam Pump Works, Indianapolis, Ind.
Goulds Mfg. Co., Seneca Falls, N. Y.
Hoover & Colville Steam Pump Co., St. Louis, Mo.

McGowan, J. H. & Co., Cincinnati, O.
Maslin, J. & Son, Jersey City, N. J.
Norwalk Iron Works Co., So. Norwalk Conn.
Southwark Fdy. & Mch. Co., Phila., Pa.
Valley Pump Works, Easthampton, Mass.
Worthington, Henry R., 86 and 88 Liberty St., N. Y.

Pump Leathers.
Detroit Valve & Washer Co., Detroit, Mich.

Pumps, Makers of.
Deming Co., Salem, O.
Douglas, W. & B., Middletown, Conn.
Goulds Mfg. Co., Seneca Falls, N. Y.
Myers, F. E. & Bro., Ashland, O.

Punches.
Richards, I. P., Providence, R. I.

Punches and Shears, Hand and Power.
E. W. Bliss Co., Brooklyn, N. Y.
Butts & Ordway, Boston, Mass.
Crosby, G. A. & Co., Chicago, Ill.
Long & Allstatter Co., Hamilton, Ohio.
Stiles & Parker Press Co., Brooklyn, N. Y.
Waterbury Farrel Foundry & Machine Co., Waterbury, Conn.
Watson & Stillman, 204 E. 43d, N. Y.

Rails, Old and New.
Perry, W. H. & Co., Providence, R. I.

Rat and Mouse Traps.
Burditt & Williams, Boston, Mass.
Estey, W. S., 65 Fulton, N. Y.
Excelsior Cutlery Co., Worcester, Mass.

Razor, Manufacturers of
Millbury Razor Co., Millbury, Mass.

Reducing Valves.
D'Este & Seeley Co., Boston, Mass.

Reels.
Hendryx, A. B. Co., New Haven, Conn.

Refrigerators.
Wisconsin Refrigerator Co., Eau Claire, Wis.

Rivets.
Blake & Johnson, Waterbury, Conn.
Burden Iron Co., Troy, N. Y.
Clark & Cowles, Plainville, Conn.
Cobb & Drew, Plymouth, Mass.
Sternbergh, J. H. & Son, Reading, Pa.
Townsend, W. P. & Co., New Brighton, Pa.

Riveting Machines.
Adt, Jno. & Sons, New Haven, Conn.

Rolling Mill Machinery.
Birmingham Iron Fdy., Birmingham, Conn.
Booth, The Lloyd Co., Youngstown, O.
Leechburg Foundry & Mch. Co., Pittsburgh, Pa.
Morgan Construction Co., Worcester, Mass.

Robbins, Chilled, Sand and Steel.
Birmingham Iron Foundry, Birmingham, Conn.
Booth, The Lloyd Co., Youngstown, O.
East Chicago Fdy. Co., Chicago, Ill.
Garrison, A. Fdy. Co., Pittsburgh, Pa.
Robinson-Res Mfg. Co., Pittsburgh, Pa.
Seaman, Sleeth & Black, Pittsburgh, Pa.
Totten & Hogg Iron and Steel Fdy. Co., Pittsburgh, Pa.

Roofing.
Cincinnati Corrugating Co., Piqua, O.
N. Y. Iron Roofing & Corrugating Co., Jersey City, N. J.

Rope and Web Goods.
Covert Mfg. Co., West Troy, N. Y.
Covert's Saddlery Wks., Farmer, N. Y.

Rope Wheels.
Cresson, Geo. V. Co., Philadelphia, Pa.

Rubber Goods.
Canfield, H. O., Bridgeport, Conn.

Rules, Manufacturers of.
Stanley Rule & Level Co., 29 Chambers-Stephens & Co., Riverton, Conn.

Sad Irons.
Enterprise Mfg. Co., Phila., Pa.
Streeter, N. R. & Co., Groton, N. Y.

Sad Irons, Gas.
Bolgianno Mfg. Co., Baltimore, Md.

Sand Paper.
Baeder, Adamson & Co., Phila., Pa.

Sash Balances.
Caldwell Mfg. Co., Rochester, N. Y.
Pullman Sash Balance Co., Rochester, N. Y.

Sash Cords and Chains.
Morton, Thos., 65 Elizabeth, N. Y.
Samson Cordage Works, Boston, Mass.
Smith & Egge Mfg. Co., Bridgeport.

Sash Locks.
Champion Safety Lock Co., Cleveland, Ohio.

Sash Pulleys.
Palmer Hardware Mfg. Co., Troy, N. Y.

Sash Weights.
Brown, E. E., & Co., Philadelphia, Pa.
Kings County Iron Foundry, Brooklyn, N. Y.
Norton Bros., Chicago, Ill.

Saw Filing Machines.
Dilston, Henry & Sons, Philadelphia, Pa.

Saws, Makers of.
Atkins, E. C. & Co., Indianapolis, Ind.
Dilston, Henry & Sons, Phila., Pa.
National Saw Co., Newark, N. J.
Simonds Mfg. Co., Fitchburg, Mass.

Saw Sets.
Taintor Mfg. Co., 84-86 Chambers, N. Y.

Saw Vises.
Seneca Falls Mfg. Co., Seneca Falls, N. Y.

Sawing Machines.
Q. & C. Co., Chicago, Ill.

Scales, Manufacturers of.
Buffalo Scale Co., Buffalo, N. Y.
Chatillon, John & Sons, 85-89 Cliff, N. Y.
Standard Scale & Fixtures Co., St. Louis, Mo.

Scrapers, Road.
Sidney Steel Scraper Co., Sidney, O.

Screens, Coal and Ore.
Hendrick Mfg. Co., Ltd., Carbondale, Pa.

Screw Cutting Machinery.
Wells Bros. & Co., Greenfield, Mass.
Wiley & Russell Mfg. Co., Greenfield, Mass.

Screw Drivers.
Brown, R. H. & Co., New Haven, Conn.
Mayhew, H. H. Co., Shelburne Falls, Mass.

Screw Machinery.
Hartford Machine Screw Co., Hartford, Conn.

Screw Plate and Pipe Cutter.
Jareckl Mfg. Co., Erie, Pa.

Screws, Makers of.
American Screw Co., Providence, R. I.
Blake & Johnson, Waterbury, Conn.
Wm. H. Haskell Co., Pawtucket, Conn.
Miles, F. S., 205 Quarry, Philadelphia, Pa.
Phila. Mach. Screw Works, Phila., Pa.
Reynolds & Co., New Haven, Conn.
Worcester Machine Screw Co., Worcester, Mass.

Screw Saws.
Barnes, W. F. & John, Rockford, Ill.
Millers Falls Co., 93 Read St., N. Y.
Seneca Falls Mfg. Co., Seneca Falls, N. Y.

Scythe Stones and Whetstones.
Pike Mfg. Co., Pike Stat'n, N. H.
Cleveland Stone Co., Cleveland, O.

Shafting, Makers of.
Brown, A. & F., 17 Dey St., N. Y.
Cresson, Geo. V. Co., Philadelphia, Pa.
Fairmount Mch. Co., Philadelphia, Pa.
Sellers, Wm. & Co., Inc., Philadelphia, Pa.
Stow Mfg. Co., Binghamton, N. Y.

Shaped Iron and Steel, Manufacturers of.
Aetna-Standard Iron & Steel Co.,
Bridgeport, O.
East Chicago Fdy. Co., Chicago, Ill.

Allentown Rolling Mill, Allentown, Pa.
Lockhart Iron & Steel Co., Pittsburgh, Pa.

Pascagoula Rolling Mill Co., Paterson, N.J.
The Phoenix Iron Co., Phila., Pa.

Pottsville Iron & Steel Co., Pottsville, Pa.

Roberts, A. & P. & Co., Phila., Pa.

Tudor Iron Works, St. Louis, Mo.

Shears and Scissors.

Acme Shear Co., Bridgeport, Conn.

Claus Shear Co., Fremont, Ohio.

Heinrichs, R. Sons Co., Newark, N.J.

Sheet Iron and Steel, Manufacturers of.

Alta-Standard Iron and Steel Co., Bridgeport, O.

Cambridge Iron & Steel Co., Cambridge, Ohio.

Jersey City Galvanizing Co., 112 John St., N.Y.

Mahoning Valley Iron Co., Livingston, Ohio.

Morehead-McCleane Co., Pittsburgh.

Pierson & Co., 29 Broadway, N.Y.

Singer, Nimick & Co., Ltd., Pittsburgh, Pa.

The Mahoning Valley Iron Co., Youngstown, O.

Alan Wood Co., Philadelphia.

W. Dewees Wood Co., McKeesport, Pa.

Sheet Zinc.

Mathiessen & Hegeler Zinc Co., La Salle, Ill.

Shelf Brackets.

Atlas Mfg. Co., New Haven, Conn.

Stanley Works, New Britain, Conn.

Shoe Stands.

Kupferle, Jno. C. St. Louis, Mo.

Show Cases.

Union Show Case Co., Chicago, Ill.

Sinks.

Douglas, W. & B., Middletown, Conn.

Skate Grinding Machinery.

Perkins, Chas., Bridgewater, Mass.

Skates, Ice.

Barney & Berry, Springfield, Mass.

Keene Mfg. Co., Keene, N.H.

Supplee Hardware Co., Phila., Pa.

Winslow, Sam'l, Skate Mfg. Co., Worcester, Mass.

Skates, Roller.

Henley, M. C., Richmond, Ind.

Winslow, Sam'l, Skate Mfg. Co., Worcester, Mass.

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Tucker & Dorsey Mfg. Co., Indianapolis, Ind.

Smelting Works.

Reeves, Paul S., 760 S. Broad, Phila.

Soldering Coppers.

Cleenden Bros., Baltimore, Md.

Covert Mfg. Co., West Troy, N.Y.

Speaking Tubes.

Ostrander, W. R. & Co., 204 Fulton St., N.Y.

Wollensak, J. F., Chicago, Ill.

Special Machinery.

Rhodes, L. E. Co., Hartford, Conn.

Spelter.

Mathiessen & Hegeler Zinc Co., La Salle, Ill.

Spoons and Forks.

Boardman, L. & Son, New Haddam, Conn.

Holmes & Edwards Silver Co., Bridgeport, Conn.

Rogers, The Wm. Mfg. Co., Hartford, Conn.

Sporting Goods.

Hartley & Graham, 313-315 B'way, N.Y.

Springs.

Clark & Cowles, Plainville, Ct.

Coiled Wire Belting Co., Jersey City, N.J.

Dunbar Bros., Bristol, Conn.

Miller & Van Winkle, Brooklyn, N.Y.

Morgan Spring Co., Worcester, Mass.

Roland, Wm. & Harvey, Phila., Pa.

Sabin Machine Co., Montpelier, Vt.

Tuck Mfg. Co., Brockton, Mass.

Washburn & Moen Mfg. Co., Worcester, Mass.

Wolff, R. H. & Co., Ltd., 118th St. and Harlem River, N.Y.

Spring Hinges.

Bommer Bros., Brooklyn, N.Y.

Pullman Sash Balance Co., Rochester, N.Y.

Stover Mfg. Co., Freeport, Ill.

Van Wagner & Williams Hdw. Co., 14 Warren St., N.Y.

Stamping Works.

Avery Stamping Co., Cleveland, O.

Cleveland Stamping & Tool Co., Cleveland, O.

Staples.

Cobb & Drew, Plymouth, Mass.

Titchener, E.H. & Co., Binghamton, N.Y.

Steam Gauges.

Bristol Co., Waterbury, Conn.

Star Brass Mfg. Co., Boston, Mass.

team Hammers, &c., Makers of.

Dienelt & Eisenhart, Philadelphia.

Dudgeon, Richard, 24 Columbia Street, N.Y.

Trethewey Mfg. Co., Pittsburgh, Pa.

Steam Heating & Oil Separators.

Webster, Warren & Co., Camden, N.J.

Steam Separators.

Harrison Safety Boiler Wks., Phila., Pa.

Webster, Warren & Co., Camden, N.J.

Steam Specialties.

D'Este & Seeley Co., Boston, Mass.

Lunkenheimer Co., Cincinnati, O.

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D'Este & Seeley Co., Boston, Mass.

Steel, Cold Rolled Strip.

Superior Steel Co., Pittsburgh, Pa.

Wilmot & Hobbs Mfg. Co., Bridgeport, Conn.

Steel Figures and Alphabet.

Hoefig, C. W., 52 Fulton St., N.Y.

Krogerud, W., 61 Fulton St., N.Y.

Steel Importers.

Abbott, Wheelock & Co., N.Y. and Boston.

Hobson, Francis, Seaman & Co., 97 John St., N.Y.

Jessop, Wm. & Sons, Sheffield, England, or 91 John, N.Y.

Minie, A. & Co., 1 Broadway, N.Y.

Newton & Shipman, 83 John, N.Y.

Wetherell Bros., 93 Liberty St., N.Y.

Whitney, A. R. & Co., B'way, N.Y.

Wolf, R. H. & Co., Ltd., 118th Street and Harlem River N.Y.

Steel (Musket's Special).

Jones, E. M. & Co., Boston.

Steel Manufacturers.

Alta-Standard Iron & Steel Co., Bridgeport, O.

Bethlehem Iron Co., S. Bethlehem, Pa.

Boisen, Hermann & Co., 103 Duane St., Carbon Steel Co., Pittsburgh, Pa.

Chester Steel Castings Co., Phila., Pa.

Chrome Steel Works, Brooklyn, N.Y.

Crescent Steel Co., Pittsburgh, Pa.

Frankford Steel Co., Philadelphia.

Gauthier Steel Department of Cambria Iron Co., Johnstown, Pa.

Hobson, Francis, Seaman & Co., 97 John St., N.Y.

Jessop, Wm. & Sons, Sheffield, England, or 91 John, N.Y.

Kayser, Ellison & Co., Sheffield, Eng.

La Belle Steel Co., Pittsburgh, Pa.

Landon Iron Co., Salisbury, Conn.

Lukens Iron & Steel Co., Coatesville, Pa.

Moorhead-McCleane Co., Pittsburgh, Pa.

Moss, F. W., 83 John, N.Y.

Pottsville Iron and Steel Co., Pottsville, Pa.

Bowland, Wm. & Harvey, Frankford, Philadelphia.

Singer, Nimick & Co., Pittsburgh.

Superior Steel Co., Pittsburgh, Pa.

Wordlaw, S. & C., Sheffield, Eng.

Wetherell Bros., 93 Liberty, N.Y.

Wilmot & Hobbs Mfg. Co., Bridgeport, Conn.

Steel, Manufacturers' Agents.

Barns, C. K. & Co., Philadelphia, Pa.

Butze, Adolph, St. Louis, Mo.

Corning, Edw. & Co., 29 B'way, N.Y.

Lindsay, Jas. G. & Co., Phila., Pa.

Pferson & Co., 29 Broadway, N.Y.

Steel Rails, Manufacturers of.

Bethlehem Iron Co., S. Bethlehem, Pa.

Cambria Iron Co., Johnstown, Pa.

Montour Iron & Steel Co., Danville, Pa.

Riverside Iron Wks., Wheeling, W.Va.

Steel, Tool.

Frankford Steel Co., Philadelphia, Pa.

Jessop, Wm. & Sons, Sheffield, England, 91 John, N.Y.

Jones, B. M. & Co., Boston, Mass.

La Belle Steel Co., Pittsburgh, Pa.

Step Ladders, Rolling.

Bicycle Step Ladder Co., Chicago, Ill.

Coburn Trolley Track Mfg. Co., Holyoke, Mass.

Croissant, M., Albany, N.Y.

Stocks and Dies.

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Butterfield & Derby, Derby Line, Vt.

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Oster Mfg. Co., Cleveland, O.

Saunders' Sons, D., Yonkers, N.Y.

Wells Bros. & Co., Greenfield, Mass.

Wiley & Russell Mfg. Co., Greenfield, Mass.

Stone Saws and Planers.

Lincoln Iron Works, Rutland, Vt.

Stone Fixtures.

Wernicke Co., Minneapolis, Minn.

Stove Linings.

Ostrander Fire Brick Co., Troy, N.Y.

Stove Pipe Thimbles.

Cheney, S. & Son, Manlius, N.Y.

Stove Trucks.

Tucker & Dorsey Mfg. Co., Indianapolis, Ind.

Street Lamps.

Steam Gauge & Lantern Co., Syracuse, N.Y.

Structural Iron Work.

Lindsay, Jas. G. & Co., Phila., Pa.

Structural Tubing.

National Structural Tubing Co., Potter Bldg., N.Y.

Valves, Gas, Water and Steam.

Chapman Valve Mfg. Co., Boston.

Eynon-Evans Mfg. Co., Philadelphia, Pa.

Jenkins Bros., 71 John, N.Y.

Lunkenheimer Co., Cincinnati, O.

McNab & Harlin Mfg. Co., 56 John, N.Y.

Ventilating Fans.

Perkins, B. F. & Son, Holyoke, Mass.

Ventilator Appliances.

Howard & Morse, 15 Fulton St., N.Y.

Vise Jaws.

Newark Mch. Tool Co., Newark, N.J.

Vises.

Hollands Mfg. Co., Erie, Pa.

Howard Iron Works, Buffalo, N.Y.

Lewis Tool Co., 44 Barclay St., N.Y.

Millers Falls Co., 93 Readte St., N.Y.

Prentiss Vise Co., 44 Barclay, N.Y.

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Covert Mfg. Co., West Troy, N.Y.

Covett's Saddlery Works, Farmer, N.Y.

Washers.

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Milton Mfg. Co., Milton, Pa.

Sternbergh, J. H. & Son, Reading, Pa.

Washing Machines.

Richmond Cedar Wks., Richmond, Va.

Water Meters.

Worthington, Henry R., 86 & 88 Liberty St., N.Y.

Water Wheels.

Poole, Robt. & Son Co., Baltimore, Md.

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Bryan Mfg. Co., Bryan, Ohio.

Sidney Steel Scraper Co., Sidney, O.

Withington & Cooley Mfg. Co., Jackson, Mich.

Window Cord, Makers of.

Samson Cordage Works, Boston, Mass.

Wire, Manufacturers of.

Baackes & Co., Pittsburgh, Pa.

Cincinnati Barb Wire Fence Co., Cincinnati, O.

Gauthier Steel Department of Cambria Iron Co., Johnstown, Pa.

Miller & Van Winkle, Brooklyn, N.Y.

New Castle Wire Nail Co., New Castle, Pa.

New Haven Wire Mfg. Co., New Haven, Conn.

Prentiss, Geo. W. & Co., Holyoke, Mass.

Salem Wire Nail Co., Salem, O.

Trenton Iron Co., Trenton, N.J.

Washburn & Moen Mfg. Co., Worcester.

Wetherell Bros., 93 Liberty St., N.Y.

Wolf, R. H. & Co., Ltd., 118th St. and Harlem River, N.Y.

Wright & Colton Wire Cloth Co., Worcester, Mass.

Wire Cloth.

Barnum, E. T., Detroit, Mich.

California Wire Works, San Francisco, Cal.

Clinton Wire Cloth Co., Clinton, Mass.

Darby, Edward & Sons, Philadelphia.

Este, W. S., 65 Fulton, N.Y.

Gilbert & Bennett Mfg. Co., 42 Cliff.

Howard & Morse, 45 Fulton, N.Y.

Ludlow-Saylor Wire Co., St. Louis, Mo., N.J.

New York Wire Cloth Co., 102 Chambers St., N.Y.

Scheeler & Sons, Buffalo, N.Y.

Wickwire Bros., Cortland, N.Y.

Wright & Colton Wire Cloth Co., Worcester, Mass.

W. S. Tyler Wire Works Co., Cleve'd.

Wire Cutters.

King, J. M. & Co., Watertown, N.Y.

Wire Dies.

McFarland, Wm., Trenton, N.J.

Newton & Shipman, 83 John St., N.Y.

Wire Dowels.

Bond Nail Co., Raynham, Mass.

Wire Fences, See Fencing, Iron and Wire.

Wire Goods, Manufacturers of.

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Darby, Edward & Sons, Phila.

Gilbert & Bennett Mfg. Co., 42 Cliff St., N.Y.

Ludlow-Saylor Wire Co., St. Louis.

New York Wire Cloth Co., 102 Chambers St., N.Y.

Scheeler & Sons, Buffalo, N.Y.

Wickwire Bros., Cortland, N.Y.

Williamson, C. T., Wire Novelty Co., Newark, N.J.

Wire Goods Co., Worcester, Mass.

Wire Hangers.

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Wire Machinery.

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Morgan Construction Co., Worcester, Mass.

Waterbury Mch. Co., Waterbury, Conn.

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California Wire Works, San Francisco, Cal.

Indiana Wire Fence Co., Crawfordsville, Ind.

Kilmer Mfg. Co., Newburg, N.Y.

New Castle Wire Nail Co., New Castle, Pa.

Salem Wire Nail Co., Salem, O.

Taunton Wire Nail Co., Taunton, Mass.

Whitney, A. R. & Co., New York City.

Wire Rods, Steel.

Baackes & Co., Pittsburgh, Pa.

New Castle Wire Nail Co., New Castle, Pa.

Washburn & Moen Mfg. Co., Worcester, Mass.

Whitney, A. R. & Co., 17 B'way, N.Y.

Wolff, R. H. & Co., Ltd., 118th Street and Harlem River, N.Y.

Wire Rope, Iron and Steel, Makers.

Broderick & Bascom Rope Co., St. Louis, Mo.

California Wire Works, San Francisco.

Hazard Mfg. Co., Wilkesbarre, Pa.

A. Leshen & Sons Rope Co., St. Louis.

Trenton Iron Co., Trenton, N.J.

Washburn & Moen Mfg. Co., Worcester, Mass.

Wire Rope Machinery.

Kay, J. F., Passaic, N.J.

Wire Straightening and Cutting Machinery.

Adt. John & Son, New Haven, Conn.

Wood Turning.

Cleveland Wood Turning Co., Cleveland, O.

Wood-Working Machinery.

Egan Co., Cincinnati, Ohio.

Seneca Falls Mfg. Co., Seneca Falls, N.Y.

Wrenches, Manufacturers.

Bemis & Call Hardware & Tool Co., Springfield, Mass.

Billings, Spencer & Co., Hartford, Conn.

Coe's Wrench Co., Worcester, Mass.

Trimont Mfg. Co., Roxbury, Pa.

Walworth Mfg. Co., Boston, Mass.

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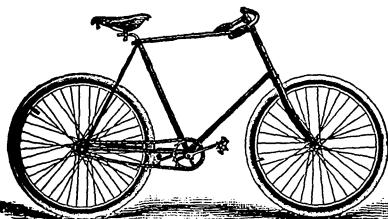
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Leavitt Machine Co.....	42	Nicholson File Co.....	65	Samson Cordage Works.....	1	Townsend, W. P. & Co.....	94	
Le Count, C. W.....	87	Nicolls, Wheeler & Co.....	20	Samuel, Frank.....	14	Tracy, A. J. Co., Ltd	58	
Leechburg Foundry & Machine Co.	21	Niles Tool Works.....	52	Saunder's Sons, D.....	39	Trenton Iron Co.....	4	
Long's, Jno. S. Son & Co.....	102	North Bros. Mfg. Co.....	17 & 57	Sawyer Hdw. & Supply Co.....	39	Trethewey Mfg. Co.....	24	
Leonard, B. E.....	88	North American Metalline Co.....	3	Scattergood, H. W.....	49	Trimont Mfg. Co.....	88	
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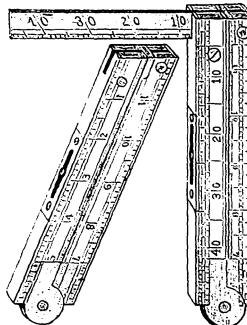
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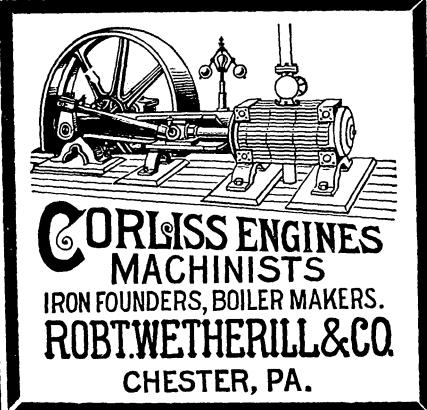
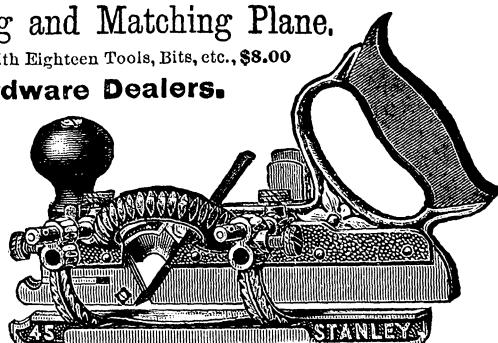
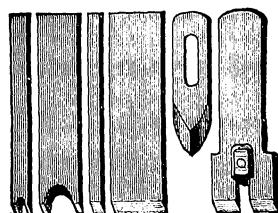
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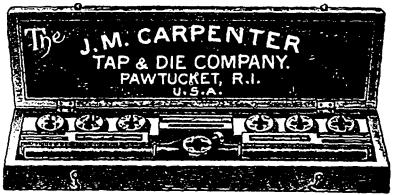


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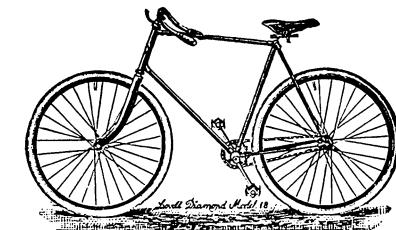
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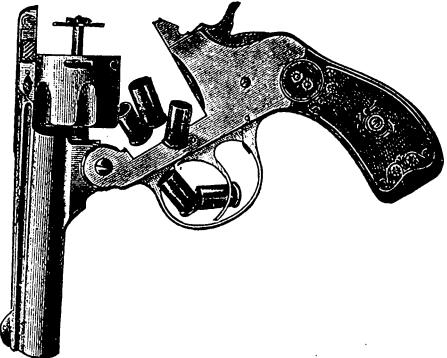
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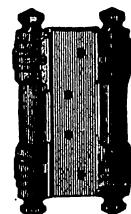
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THE IRON AGE

THURSDAY, NOVEMBER 29, 1894.

An Old Time Pumping Engine.

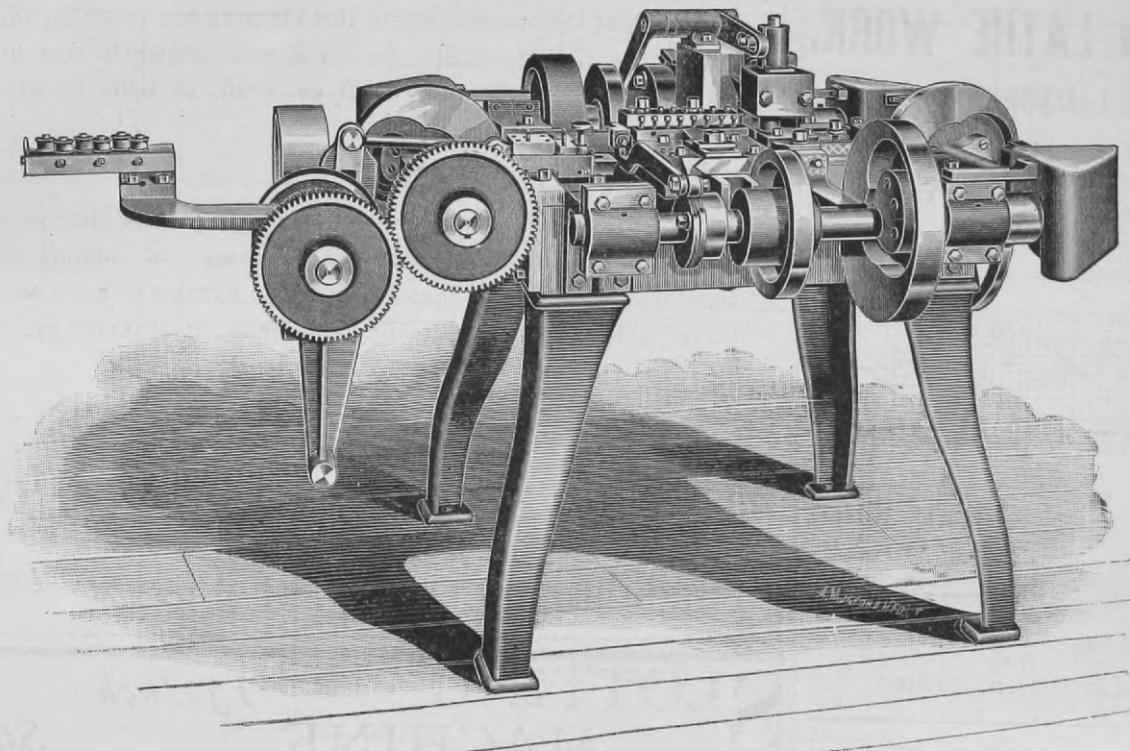
A correspondent of the London *Engineer* describes as follows a fine old Newcomen atmospheric pumping engine which he recently found at work, at a colliery near Bristol :

As the pit is fairly dry the engine is only worked during the night for about two nights a week. On arrival at the colliery we hunted up the engineer, who provided us with a couple of lamps and conducted us to the ancient driver. This individual, who looked fully as old as his engine, but who, in response to sympathetic inquiries, assured us that he was not so "owld as 'a looked,"

of water on to the top side, which being helped by the atmosphere on the indoor stroke, leaks through as fast as it is delivered. This method of water packing is to be preferred to the other elegant method adopted in the old days, which consisted in shooting a load or two of dung on to the top of the piston. The beam is a wonderful structure, with a "horse's head" at each end, the inner end being connected to the three piston rods by means of stout chains. Our guide related how the soundness of the cylinder bottom had been tested more than once by the snapping of these chains, the piston and rods coming down with a crash. The steam is taken from a large

The Manville Band Metal and Wire Forming Machine.

The machine illustrated in the accompanying engravings is intended to form different shapes of wire or band metal fed to the machine continuously from a coil. The machine is exceedingly simple in principle and the work, no matter of what character, may be said to be done by four die carrying slides, which move toward a common center. Although there are other secondary or supplementary movements these four are the most essential, and about them all the minor parts are grouped. If we consider these four dies as moving on



THE MANVILLE BAND METAL AND WIRE FORMING MACHINE.

led the way to the engine house door. This having been persuaded by gingerly treatment to open without falling in, we descended a flight of steps covered about 6 inches deep with dust, and reached the basement. The cylinder of the engine is 6 feet internal diameter and about 10-foot stroke, the valves being worked partly by hand and partly by means of a heavy plug rod hung from the beam.

Naturally the construction is extremely primitive and the iron work never having experienced the luxury of a coat of paint is in a very advanced state of decomposition. Some of the smaller flanges past which the steam has been leaking for perhaps 100 years are fully three-quarters rust. Amid clouds of steam we stumbled up the dusty steps to the top of the cylinder and were shown a place where the cylinder side had been rusted completely through, but which had been successfully stopped up with cement! Water packing is used for the piston, a 2 inch pipe delivering a constant stream

receiver, which is in connection with the main boilers of the colliery, the pressure, of course, being greatly reduced.

The engine, according to the driver, was put down upward of 100 years ago. The old man had driven it himself since the days when he was a boy so small that he had to stand on a block to reach the valve handles, and his father and grandfather had driven it before him.

At present there appears to be nobody but the old driver about the colliery who is sufficiently acquainted with the idiosyncrasies of the engine to be able to work it, and as there is a possibility that that patriarch will at some future date depart from this earthly life, it is supposed that from that date the engine will be allowed to rest in honorable retirement. It is even possible that it will one day grace the interior of the noble building at South Kensington which has become the last refuge of many engineering antiquities of a more recent date.

the lines of the cardinal points of the compass their order of approach would be as follows: The south die moves toward the center to perform the first operation; then either one or both of the east and west dies move in, and finally the north die moves to complete the work. If the particular shape being made does not demand the use of both the east and west dies, either one may be thrown out and left idle. In the same way if the work can be performed without using the north die, that also can be made inoperative. The distance of movement of each die can be adjusted to meet the requirements of the work in hand. It will thus be seen that having a center upon which to work, almost any shape desired can be produced by the employment of dies of the proper form. All the movements of the machine are positive and are performed as shown in the perspective view, by cams placed upon the driving shafts.

Referring now to the engravings, Fig. 2 is a plan view, Fig. 3 is a diagram showing, roughly, the dies required to

produce the bracket shown in Fig. 4, the heavy line separating the dies *b*, *c*, *d* representing the bracket; Figs. 5, 6, 7 and 8 indicate other shapes. The wire or metal tape is fed to the machine from a reel by the feed *A*, first passing through the straightening rolls shown at the left in the perspective view. The band is held by the clamping lever *F*, while the cutting off and punching head (if there are holes required in the band) *B*, operated by the cams *C* *D*, performs its duty. The piece, now cut to the proper length, passes in front of a pin or stud, *I*, when a die operated by the cam *H* moves forward and bends the band partly around the pin. The

variety of shapes may be produced. Further than this, the machine will make any desired size of the same shape, from the smallest up to the limit of its capacity. The machine is powerfully built, and is designed for performing heavy work rapidly and accurately. It was built by the E. J. Manville Machine Company of Waterbury, Conn.

the sinking of ground on which they were built, the result of the mining operations below.

Comparison of Strength in Specialty Mixtures of Cast Iron.

BY GUS. C. HENNING, NEW YORK.

The Iron Age of November 1 contains a paper by Thos. D. West, read before the Western Foundrymen's Association October 24, and as the conclusions do not seem to be borne out by

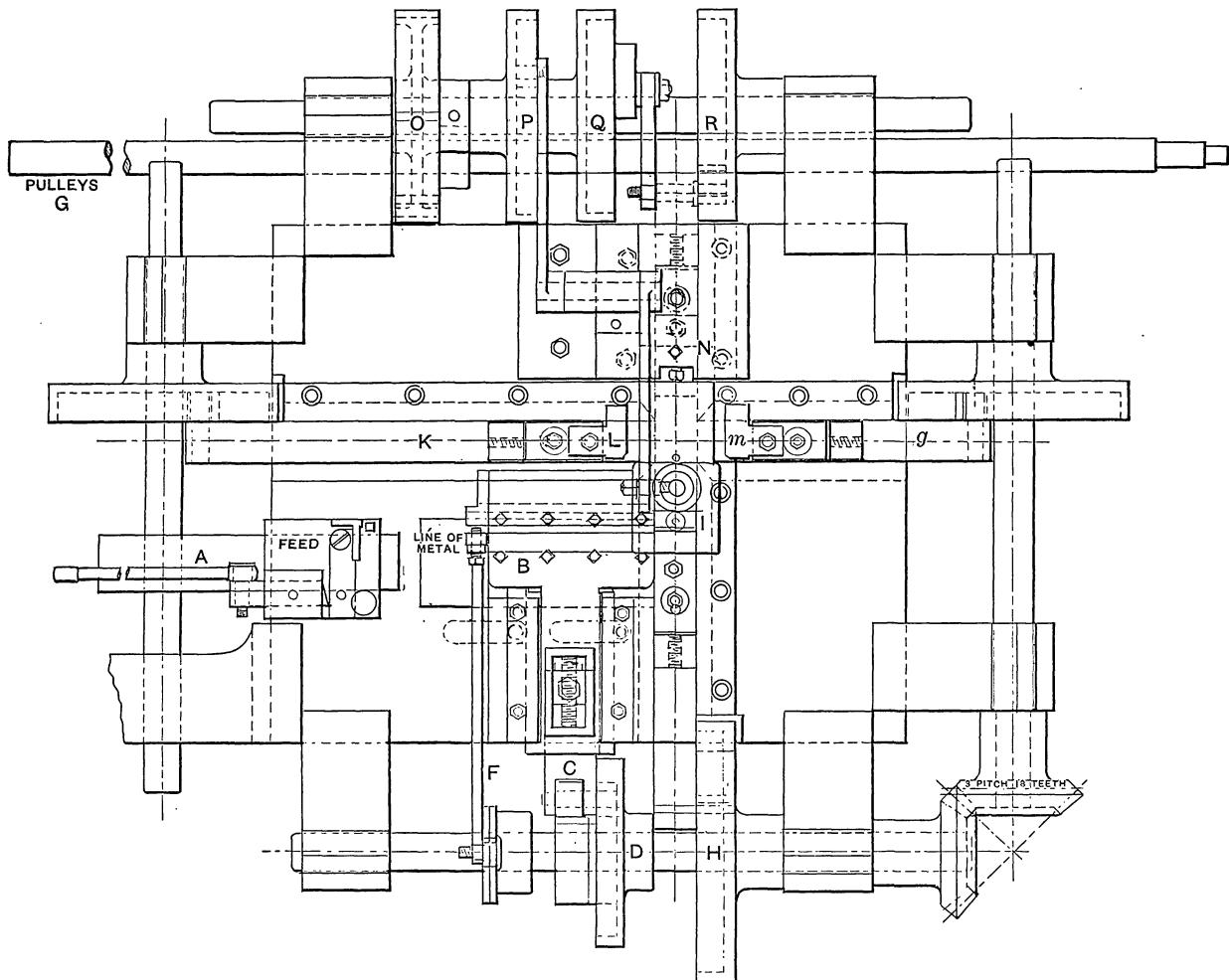


Fig. 2.—Plan.

THE MANVILLE BAND METAL AND WIRE FORMING MACHINE.

two side, or east and west, dies *L* *m*, actuated from cams by the connections *K* *g*, now move toward each other and form the legs of the bracket, after which the north die *N*, operated by the cam *R*, travels forward to make the foot. The cam *Q* throws the ram carrying the pin or stud back, while the cam *P* operates a stripper. The four dies are shown in their initial positions by the dotted lines *b*, *c*, *d*, Fig. 3, and in their final positions by the shaded portions *b*, *c*, *d*, the stud or pin forming the center being indicated at *a*. The machine is driven by the pulley *G*, the power being transmitted by bevel gears to the cam shafts placed on each of the four sides of the frames.

From the above it will be understood how, by modifying the forms of the dies and properly adjusting the extent of their travel, an almost infinite

crushed coke, is that it is smokeless. The grates under locomotive boilers will require slight alterations to adapt them to the new fuel and the tenders will have to be built higher.

the results given, I desire to point out in which particulars they seem to be faulty. The committee for which these tests were made was appointed to investigate the relative value of "Round vs. Square Test Specimens." The discussion which led to the appointment of this committee showed with remarkable force and unanimity that results heretofore obtained with cast iron were dependent rather upon the founder and his methods than upon anything else; and the attempted introduction of a system of uniform methods of testing cast iron was the first cause of the discussion.

Mr. West's object in making the investigation was, as he says, threefold, viz:

1. "To illustrate the fact that by casting test bars on end, we are using the best possible method to obtain the

The Coal Distilling Company, Bulmke, near Gelsenkirchen, made a profit of \$99,500 last year, and declared dividends of 17½ per cent. on preference and 12½ per cent. on common stock. The quantity of coal treated was 119,525 tons; 1147 tons of sulphuric acid were used, and the products were 82,858 tons of coke, 1241 tons of sulphate of ammonia, 1906 tons of tar and 5,450,000 gallons of ammonia liquor. There are at these works 100 by-product ovens with horizontal flues. Quite a number were rebuilt during the year owing to their destruction from

natural strength of an iron, hence more uniform results and satisfactory comparisons that are not attainable by casting test bars flat.

2. "To exhibit the desirability of using a round test bar as against a square bar in assisting to lessen erratic results, attain the iron's best strength, and afford the best means to make comparisons between rough round and turned test bars; and

3. "To prove the impracticability of using a $\frac{1}{2}$ -inch square test bar to obtain any knowledge of the natural or relative strength of cast iron, or figure its value per square inch."

Referring to West's first proposition we must turn to his first statement of results, to the effect that "it was first planned to have all these test bars cast on end, &c. . . . I changed the plan of casting and had all bars cast flat, with an incline of 2 inches, the pouring gate being at the high end." This proves that he did not even attempt to prove his first proposition, which is

missing bar included as defective, we find 29.2 per cent. defective; of 1-inch square bars eight out of 24 were defective, or 33.4 per cent.; while of the round bars four are missing, 23 were sound and 12 were defective, or 41.0 per cent. This shows that of 48 square bars, of all sizes, only 31 per cent. were defective, as against 41.0 per cent. defective round bars. These figures show conclusively that these test bars were not cast with sufficient care or by founders experienced in such work, and also that the round bars were decidedly more difficult to obtain perfect than square bars. Let me ask whether such results show more "erratic results" in the case of square or of round bars.

We must now examine the record to see whether "the iron's best strength" is obtained by round rather than by square bars. I will first reduce all the results obtained, so that we can compare the strength of the irons as though the tests had all been made on 1-inch square bars, only using the average of

give only slightly better results in round than in $\frac{1}{2}$ -inch square bars.

It is true that the 1-inch square bars show almost uniformly less strength than the round bars, and it is very difficult to assign a reason for this unusual result. Possibly it is due to the manner of measuring the square bars, which is stated to have been the "average of micrometer measurements taken from the four sides of the . . . bars"—perhaps as shown in Fig. 1 and equal to $a + b + c + d$

4

As is well known, square cast bars generally have a shape, as shown in Fig. 2. And supposing that the test bars followed the rule, the measurements given were too large, and hence the strength should have been greater per square inch. Now, assuming that such errors of measurements, or shape, amounted to not more than $\frac{1}{16}$ inch, this would be more than ample to account for all the differences.

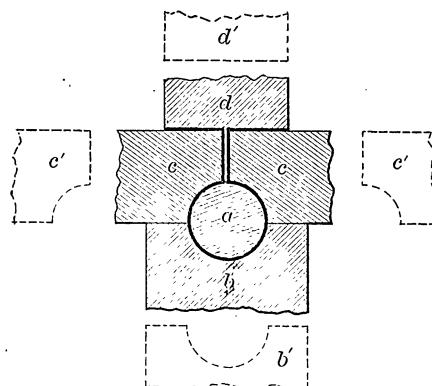


Fig. 3.—Dies to Form Fig. 4.

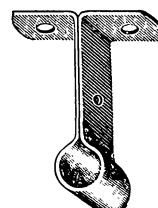


Fig. 4.



Fig. 5.

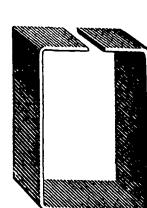


Fig. 6.



Fig. 7.

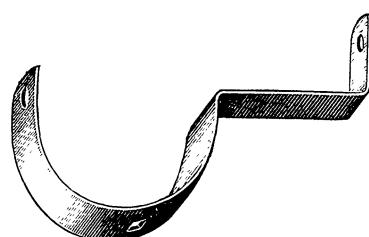


Fig. 8.

Some Shapes Formed on Machine.

THE MANVILLE BAND METAL AND WIRE FORMING MACHINE.

based entirely on his proposed method of bottom casting. Hence we can dismiss his "firstly" as not proven.

Then Mr. West informs us that each foundry furnished 12 bars—of each pattern three—namely, $\frac{1}{2}$ -inch square, 1-inch square, $\frac{1}{2}$ -inch round, and $\frac{1}{2}$ -inch round, with a swell on the middle 4 inches of $\frac{1}{2}$ -inch diameter. This would give, therefore, with seven kinds of iron, 84 test bars; but in addition to these, results of three planed $\frac{1}{2}$ -inch square bars, also of three 1-inch planed bars are reported. Hence he had 90 test bars, all told, of which the reports contain results from only 82. Results from one $\frac{1}{2}$ -inch square bar and two rough $\frac{1}{2}$ -inch bars and two turned $\frac{1}{2}$ -inch bars of gun metal are missing, as well as three $\frac{1}{2}$ -inch round turned bars of sash weight (white iron) which are accounted for. What has become of these missing bars—why does not the report say what was wrong with them? It seems that they must have been defective, otherwise the results of test would have been given.

Now let us look to the "secondly," which refers to difference in erratic results, as between square versus round bars. Of the $\frac{1}{2}$ -inch square bars one is missing, 17 are reported as sound and six as defective. Hence, with the

the results of test, excluding the palpably defective bars:

Comparative Results Referred to 1-inch Square Bar.

Metal.	$\frac{1}{2}$ -inch square bars.	1-inch bars.	$\frac{1}{2}$ -inch round bars.
Gun metal.....	4,091	3,176	3,425
Chill roll.....	2,159	2,800	2,988
Car wheel.....	2,411	2,320	2,641
Heavy machinery ..	3,093	2,495	2,502
Light machinery ..	3,682	1,681	1,698
Stove plate	1,493	1,727	1,586
Sash weight.....	1,469	1,373	1,440

Comparing these results it will be found that in two cases the square give as good and in five cases better results than the round bars, while in seven cases the results of round bars are higher. This is certainly not proof that round bars are better always. Moreover, comparing the $\frac{1}{2}$ -inch square bars only with the round bars we find that four are better while three are inferior, and that three of the better are considerably so and of just the materials which are in most common use, while those about which we care to know little as regards strength but mainly as to other casting or wearing qualities,

There is another point which may now be referred to—namely, that the paper gives results of finished bars invariably lower than those from rough bars. This is contrary to experience and reason, as deflection was uniformly greater in finished bars, showing that they should have given higher results, as removal of surface removed causes of unequal straining. This difference is without doubt due to the method of obtaining turned bars "casting 1 $\frac{1}{2}$ -inch cylindrical bars with a swell 1 $\frac{1}{2}$ inches diameter for a length of 4 inches at center, which was turned down to 1 $\frac{1}{8}$ inches diameter." Such method is sure to produce the weakest metal at the part turned down, and these tests should be ample proof, for the unbiased observer, that the method is radically faulty. Proof that finished bars are stronger than rough castings both in theory and by actual test can be found in the principal authorities. (See C. Bich, "Elasticity and Resistance," second edition, 1894, page 114, *et seq.*) However, the results of all the round bars again show such great variations that we can only conclude that the test bars were poor castings, and of little value for comparative purposes. The "thirdly" is disproven by the foregoing, as it has been shown that while 29.2 per cent. of

all $\frac{1}{2}$ -inch square bars were defective, 41.0 per cent. of the round bars are so reported. This shows which shape is the most impracticable. The average strength of $\frac{1}{2}$ inch bar having also been shown to be greater than that of larger square and certainly than that of the round bars, I cannot admit that the latter is the better "for obtaining any knowledge of the natural or relative strength of cast iron, or figure its strength per square inch."

Now let us look at how Mr. West obtains his "knowledge of strength per square inch" from a transverse test; we find that he merely divides the load at rupture by the area of test piece, whether square or round. What a beautifully easy method this is. Need we really discuss this method any further?

The following table shows tensile strength as deduced from the results given in the paper:

Tensile Strength.

	$\frac{1}{2}$ -inch square bar	1-inch square bar.	$1\frac{1}{2}$ -inch round bar.
Chill Roll.....	23,500	22,610	30,710
Heavy machinery....		25,00	18,430
Light machinery....	23,880	18,230	20,550
Stove plate.....	20,170	16,800	17,100

This table again shows, if anything at all, that square bars give better results than round bars, as only the chill roll

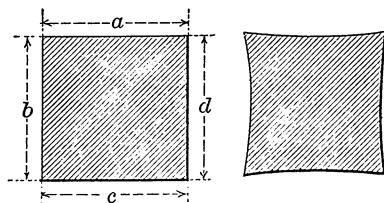


Fig. 1.

Fig. 2.

metal gave better results when cast round than square; besides this the $\frac{1}{2}$ -inch square gave better results than the 1-inch square bars. So we once more see that the $\frac{1}{2}$ -inch bars are more satisfactory.

Now, I wish to call attention to a fundamental error made by Mr. West in obtaining the test bars which he discusses. He informs us that large and small bars of each material "were cast in one flask at the same time," hence at the same temperature. Heretofore Mr. West has told us that relation of temperature and size of casting play a very important part in producing good and uniform results, and hence we may ask why were these test bars not cast each size by itself, at the most suitable temperature? When using a gun iron it becomes absolutely necessary to cast $\frac{1}{2}$ inch and $1\frac{1}{2}$ or 1 $\frac{1}{2}$ inch bars at temperatures varying considerably. Every founder knows this to be necessary, and hence Mr. West must answer why it was not done in this case, when his object was to show the most favorable results obtainable by each size of bar and for comparative purposes only. As this was not done I deny absolutely the propriety of using the tests reported for comparisons. In order to prove the superiority of any particular size of test bar, the greatest care must be used in producing each separate size of bar under the most favorable controllable conditions. Without this the investigation becomes valueless.

*Open Hearth Steel.—II.**

The expansion of silica brick under a high temperature is one of the difficulties encountered in the construction of the Siemens furnace, and in no part of

the requirements, and which is regarded with very great favor in several of the large Siemens plants in England. The air enters the furnace by two ports each 24 inches wide and standing immediately over the two gas ports, which are $18\frac{1}{2}$ inches wide. The air therefore splits

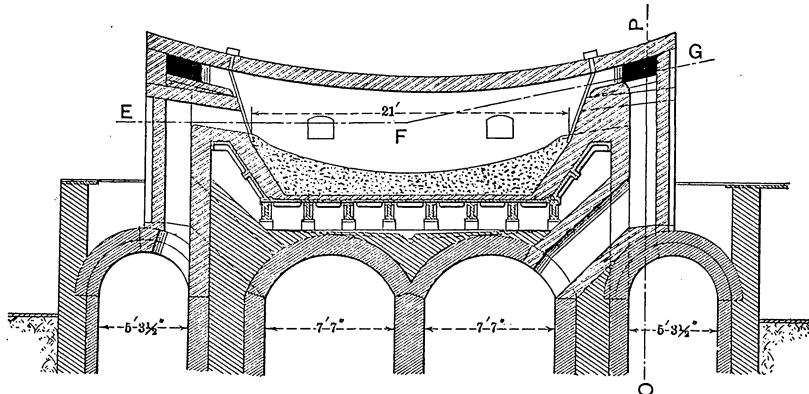


Fig. 3.—Vertical Section through A B C D, Fig. 4.

ENGLISH TWENTY-FIVE TON OPEN HEARTH FURNACE.

the furnace is this felt so much as at the ports. They should, therefore, be of as simple and compact a form as possible, in one block without offsets, and remembering always that the fewer they are in number the more solidity

the two streams of gas and also overlaps them on the sides, and being uppermost it protects the roof from the flame, throws the gases downward on the charge and finally presents to the bath a flame that melts without excessive

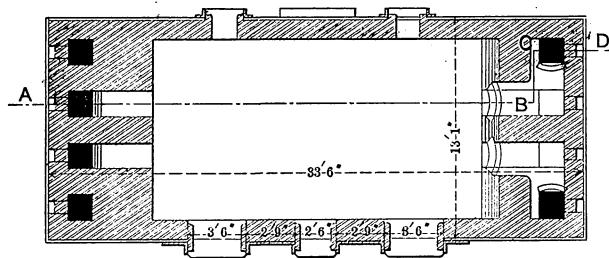


Fig. 4.—Horizontal Section E F G, Fig. 3.

and strength will the brick work have. Bricks are always liable to be displaced in the flat sides of the rising passages, and this should be provided for by building narrow slots of 9-inch work at the ends of the furnace, through which the inner walls of the ports may be cooled and reset when required. The expansion of the silica brick is rather an advantage than otherwise as far as

oxidation. This is not secured with alternate horizontal ports. The strength of the block and the stability of the side walls of the ports are materially increased by the arching of the port roofs, while their size is so considerable that they are not so easily obstructed by dis-

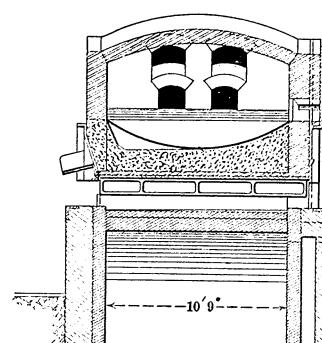


Fig. 5.—Vertical Section.

the roof is concerned, for if that contracted on heating up it would collapse.

In Figs. 3, 4, 5 and 6 a block is shown which perfectly answers the above re-

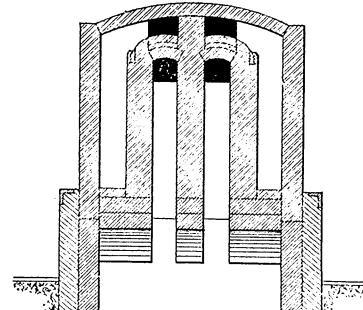


Fig. 6.—Section at O P, Fig. 3.

placed bricks or slag. Their arrangement is such that the rising gas and air ports are parallel, and in plan they form with the hearth a rectangle capable of being strongly and simply inclosed in the casing and bound together by tie rods. The furnace has a capacity of 25 tons, the hearth being 21 feet long by 10 feet 9 inches broad. The gas is con-

* See *The Iron Age*, November 15, page 851.

ducted from the producers to the furnaces not in siphon tubes but in a large flue below the floor level, the brick work of which is thick and backed up with concrete to prevent the infiltration of water; by this means the gases arrive with a reduction in temperature of about 20 per cent. The furnaces stand naturally at some height above the block of

how thoroughly incomplete it is in most furnaces, even when a good heat has been obtained. It is impossible to estimate the loss of fuel due to this, though theoretically the loss may be ascertained. In practice it is only too evident in complaints of poor gas, in cold charges, and in deposits of solid carbon in the regenerators. However, it is significant that the best yields of fuel, which we hope later to place before our readers, are obtained from large furnaces and high roofs combined with the simplest possible form of port.

The ports shown in Figs. 7 and 8 are of this character, and excepting the arch dividing the gas and air inlets it will stand good as long as the fur-

We have referred several times to the question of slag pockets as a valuable addition to a large furnace. If a furnace is working well there should be little difficulty arising from the checker work in the regenerators melting down provided the slag is caught and prevented from filling them up.

The slag works over the breast of the hearth in small quantities and unites with the drippings from the port roofs and walls and the solid carbon and dust of the outgoing gases, making formidable damage in the checkers. This, of course, may be in part provided for in all regenerators, but it is of the first importance that a more thorough receptacle than this be provided. Fig. 9 shows one way in which this may be done and Fig. 12 another, the latter arrangement being obtained at the expense of the checker space, so that the room allotted to the regenerators has to be increased.

Leaving for the moment questions of auxiliary appliances, practice and detail we shall now describe several furnaces which differ from the Siemens furnace proper, after which we shall return to particulars of working basic and acid charges, the laying out of plant, various appliances, and finally the cost of open hearth steel.

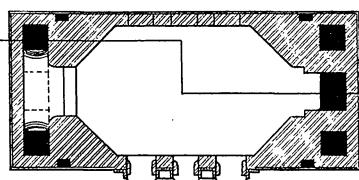


Fig. 8.—Section C D.

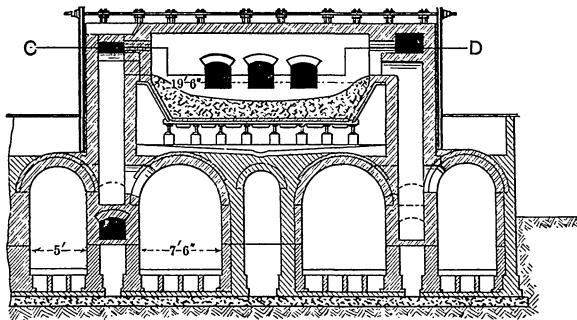


Fig. 7.—Section A B, Fig. 8.

Figs. 7 and 8.—TWENTY-FIVE TON FURNACE.—FREDERICK SIEMENS' DESIGN.

producers. Each furnace has its own stack 80 feet high, standing 45 feet from the center line. The conditions under which this furnace worked and the very good results in regard to output and cost will be made the subject of a future article.

Roofs so slightly reverberated as the last two illustrated are for all practical purposes equivalent to the Siemens straight roof. As is well known, this improvement was brought out by Frederick Siemens about 1885, shortly after the death of his brother Sir William, and though not generally approved by steel makers it is adopted by several of the leading firms in England with undoubted success. Drawings of a 25-ton furnace of this type are shown in Figs. 7, 8 and 9. The straight roof has advantages in erection and stability which are quite apparent, but why it should also be called the radiating roof is not by any means clear, for unless its height is exaggerated heat is radiated no more from this than from the reverberatory roof, and its chief value lies in the fact that it provides a roomy combustion chamber. Looking at Fig. 7 it will be seen that provision is made, just over the entrance of the air port, for throwing the flame downward a little, with the object of saving the roof from contact. This is very necessary, for the flame has a strong tendency to travel high, with the result that the roof suffers, the combustion of the gases is rendered incomplete by the cold brick work, and the hearth is slow in melting. It is better, therefore, to give the ports a fall or lead downward in the manner shown in Fig. 9, which is a part of the fastest furnace we know of anywhere.

Combustion is necessarily incomplete during the early part of melting a charge on account of the chilling surfaces exposed to the gases, but it is surprising

nace will hold together. There are only two, a single broad gas port overlapped and overridden by the air. This arrangement is sometimes varied with advantage by dividing the wide air port into two, one part at each upper corner of the gas port. The flues in Fig. 9 gradually increase as they join the

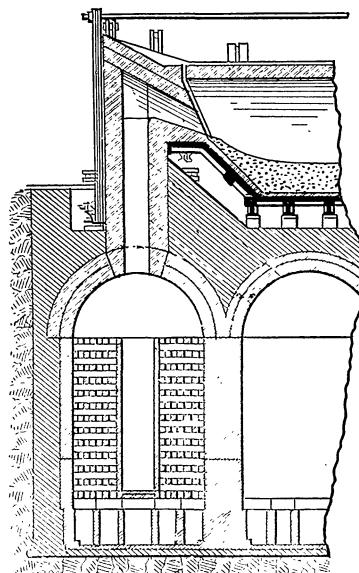


Fig. 9.—Section.

regenerator, which is a very good feature and greatly facilitates the passage of the gas. A large volume of gas and air may be admitted into these two examples of furnaces, and it is sufficient to say that that shown in Fig. 9, a 25-ton acid furnace on producer gas, turned out an average of 14 casts per week for a whole period of about four months.

The struggle now going on between several concerns who are active members of the Tinned Plate Manufacturers' Association of the United States and the Amalgamated Association, may possibly result in the disbandment of the Manufacturers' Association, but in all events will result in a considerable decrease in the number of members. The constitution of the organization provides that all labor difficulties must be settled in conference, and all wage scales heretofore in existence have been signed by the secretary of the Manufacturers' Association, and were binding on the members. On October 1, when the shut down of the tin plate mills occurred, some six or seven concerns refused to be bound by the action of the Manufacturers' Association, and continued to operate their plants under the old scale of wages, with the understanding that they would be allowed any concessions that might be granted to the other concerns by the Amalgamated Association. Under the constitution these concerns have forfeited their rights as members and can no longer be said to legally belong to the association. At the time that the Apollo Iron & Steel Company of Apollo, Pa., and Kirkpatrick & Co. of Leechburg, Pa., started with non-union men, it is understood both concerns sent in their resignations as members of the Manufacturers' Association. Now that Wallace, Banfield & Co., Limited, and the United States Iron & Tin Plate Manufacturing Company have also started up with non-union men, it is expected that these two concerns will also sever their connection with the organization.

The National Tin Plate Company of Anderson, Ind., who are erecting a new plant, drilled in a monster gas well on the 22d inst. It has a flow of 8,000,000 cubic feet per day, and is one of the best wells ever drilled in Indiana.

The Vulcan Iron Works of Chicago have secured a contract for building and equipping a \$75,000 pleasure yacht, to be used for cruising in Southern waters. The builders expect to turn out a model boat in every respect.

How Shall we Gauge Wire and Sheets?

BY OBERLIN SMITH.

It was Carlyle, if I remember aright, who said that the population of England was so many millions—mostly fools. However indignantly we may repudiate the descriptive portion of the distinguished cynic's remarks as applied to the people of our mother country in general, we can scarce but admit the partial foolishness of that portion of the population who have been engaged at various times during a century past in the industry of inventing wire gauges. In America, too, we find that either heredity or example, or both, has caused a further development of this pernicious industry, and that the crowning absurdity of all its products has, not many months since, been indorsed and legalized by no less eminent authorities than the two Houses of Congress and the President of the United States. The only comfort in connection with this ridiculous legislation is that it did not require any all night sessions or use of the cloture to pass it, and, furthermore, that few people will probably ever hear of it again.

The measure referred to, which became the law of the land last year, creates a new United States Standard gauge for measuring iron and steel sheets. This gauge, instead of remedying the evils pertaining to the so-called wire gauges which have for so long afflicted a much enduring mechanical and commercial public, only intensifies them by adding a new set of arbitrary measurements to the numerous others already in use, by making these measurements more inexpressible in terms of any known unit, and by giving them names more complicated than usual. In Fig. 1 is quoted the text of this piece of interesting engineering literature (let us hope it will prove nothing more practical) in its entire enormity.

The pity of it all, in regard to the establishment of the above mentioned law, is, firstly, that we should exist in such a crude state of civilization as for it to be possible for an intelligent set of iron manufacturers, followed by a Congressional committee, and afterward by a majority of the members of both Houses of Congress, and finally by the President himself, to establish such a wild and rambling set of figures as an improvement over the chaos that before existed. Such a state of mind among our legislators betokens but ill for sundry further public action which many engineers hope for, such as reformation in the Patent Office, the establishment of various scientific standards, the testing of materials upon a really comprehensive scale, &c. The second point for which we should grieve is that the Government has been put to the expense of passing this bill, and more especially of making complete sets of the new gauges for the use of our customs officers. This I suppose has been done to meet the law's requirements, but I have no certain knowledge thereof.

Criticising the law itself, as given in full in Fig. 1, the chief point that strikes one is its entire superfluity, its mission being merely to add another to the already too numerous gauges which are based upon no scientific principle and are but poorly adapted to our practical wants. One of the chief points about this remarkable latest "standard" is that it is almost everything it should not be and fails to be almost everything

that it should be, utterly ignoring many attributes that should be embodied in a good gauge, some of which are as follows:

1. The popularity and universality which are necessary to secure definiteness of measurement in the commercial world.

2. Suggestiveness, preferably by making its unit of measurement in harmony with some other well-known unit, as, for instance, the English inch or convenient fractions thereof.

3. A logically progressive scale, with the smaller numbers for the smaller sizes, rather than a retrogressive one.

A merely casual inspection of the table, Fig. 1, will show a non-fulfillment of those conditions. Viewing the first column, it will be seen that, in common with many other of the foolish gauges in use, the scale is retrogressive, having the smaller numbers for the larger sizes, which is manifestly an absurdity, as far as the use of the gauge is concerned. The only excuse for this arrangement that I know of is that the numbers are given in the order of the operations of the wire drawer, who originally adopted the ingenious and really somewhat scientific idea of calling his rolled iron rod No. 0; his wire after

An Act Establishing a Standard Gauge for Sheet and Plate Iron and Steel.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That for the purpose of securing uniformity the following is established as the only standard gauge for sheet and plate iron and steel in the United States of America, namely:

Number of gauge.	Approximate thickness in fractions of an inch.	Approximate thickness in decimal parts of an inch.	Approximate thickness in millimeters.	Weight per square foot in ounces avoirdupois.	Weight per square foot in pounds avoirdupois.	Weight per square foot in kilo-grams.	Weight per square meter in kilo-grams.	Weight per square meter in pounds avoirdupois.
0000000	1-2	.5	12.7	320	20.00	9.072	97.65	215.28
0000000	15-32	.46875	11.90625	300	18.75	8.505	91.55	201.82
00000	7-16	.4375	11.1125	280	17.50	7.983	85.44	188.37
00000	13-32	.40625	10.31875	260	16.25	7.371	79.38	174.91
000	3-8	.375	9.525	240	15	6.804	73.24	161.46
00	11-32	.34375	8.73125	220	13.75	6.237	67.13	148.00
0	5-16	.2125	7.9875	200	12.50	5.67	61.03	133.55
1	9-32	.28125	7.14375	180	11.25	5.103	54.93	121.09
2	17-64	.265625	6.746875	170	10.625	4.819	51.88	114.37
3	1-4	.25	6.85	160	10	4.536	48.82	107.64
4	15-64	.234375	5.953125	150	9.375	4.252	45.77	100.91
5	7-32	.21875	5.5625	140	8.75	3.969	42.72	94.18
6	13-64	.203125	5.156375	130	8.125	3.685	39.67	87.45
7	3-16	.1875	4.7625	120	7.5	3.402	36.63	80.72
8	11-64	.171875	4.385625	110	6.875	3.118	33.57	74.00
9	5-32	.15625	3.96875	100	6.25	2.835	30.52	67.27
10	9-64	.140625	3.571875	90	5.625	2.552	27.46	60.55
11	1-8	.125	3.175	80	5	2.268	24.41	53.82
12	7-64	.109375	2.778125	70	4.375	1.984	21.36	47.09
13	3-32	.09375	2.38125	60	3.75	1.701	18.31	40.36
14	5-64	.078125	1.984375	50	3.125	1.417	15.26	33.64
15	9-128	.0703125	1.7859375	45	2.8125	1.276	13.73	30.27
16	1-16	.0625	1.5875	40	2.5	1.134	12.21	26.91
17	9-160	.05625	1.42875	36	2.25	1.021	10.99	24.22
18	1-20	.05	1.27	32	2	.9072	9.765	21.53
19	7-160	.04375	1.11125	28	1.75	.7938	8.544	18.84
20	8-80	.0375	.9525	24	1.50	.6804	7.34	16.15
21	11-320	.034375	.873125	22	1.375	.6237	6.713	14.80
22	1-32	.03125	.793750	20	1.25	.567	6.103	13.46
23	9-320	.028125	.714375	18	1.125	.5103	5.493	12.11
24	1-40	.025	.685	16	1	.4536	4.882	10.76
25	7-320	.021875	.55625	14	.875	.3969	4.272	9.42
26	3-160	.01875	.47625	12	.75	.3402	3.062	8.07
27	11-640	.0171875	.4365025	11	.6875	.3119	3.857	7.40
28	1-64	.015625	.398875	10	.625	.2835	3.052	6.73
29	9-440	.0140625	.3571875	9	.5625	.2551	2.746	6.05
30	1-880	.0125	.3175	8	.5	.2268	2.441	5.38
31	7-640	.0109375	.2778125	7	.4375	.1984	2.136	4.71
32	13-1280	.01018625	.25796875	6½	.40625	.1843	1.983	4.37
33	3-320	.009375	.238125	6	.375	.1701	1.881	4.04
34	11-1280	.00859875	.21828125	5½	.34375	.1559	1.678	3.70
35	5-640	.0076125	.1984375	5	.3125	.1417	1.526	3.36
36	9-1280	.00709375	.17859375	4½	.28125	.1276	1.373	3.08
37	17-2560	.006846025	.168671875	4½	.265625	.1205	1.297	2.87
38	1-160	.00625	.15875	4	.25	.1134	1.221	2.69

And on and after July 1, 1893, the same and no other shall be used in determining duties and taxes levied by the United States of America on sheet and plate iron and steel. But this act shall not be construed to increase duties upon any articles which may be imported.

SEC. 2. That the Secretary of the Treasury is authorized and required to prepare suitable standards in accordance herewith.

SEC. 3. That in the practical use and application of the standard gauge hereby established a variation of $\frac{1}{2}\%$ per cent, either way may be allowed.

Approved, March 3, 1893.

Fig. 1.

4. Uniformity of names or numbers, as, for instance, from unity upward, rather than mixing in a number of ciphers having no meaning in themselves.

5. A uniform or uniformly increasing increment in each successive size.

6. Adaptability to the convenient measurement of any substance, rather than with a limitation to a particular metal or a particular form thereof.

7. Simple and decimal fractions, rather than complicated vulgar fractions, when translated into the inch or other well-known units.

8. Capacity for additional sizes, either smaller or larger than the original ones or interpolated between the same, as requirements at first unthought of may afterward occur.

once being pulled through the drawing plate, No. 1; after twice, No. 2; after thrice, No. 3, &c. This was all very well from his point of view, until he commenced to use larger rods, when he was obliged to lose sight of the beautiful numbering of his operations, or rather to accept a false numbering, and to adopt a group of naughts for his starting point. Furthermore, as different kinds of wire and different kinds and qualities of metal were afterward introduced, different gradations in drawing plates were necessary, and thence probably arose some of the various other gauges which are shown in the tables on the following pages. This was a sort of a natural evolution, based as usual upon ignorance of the future, and one which perhaps

led the poor wire drawer to think life hardly worth living, as the numerous gauges adopted from time to time gradually got mixed up, and when gauges of this sort were used for sheets and bars, as well as for round wire, &c. Just why the makers of the new law in question should have followed this old system, and, if they did, why they should have assembled groups of ciphers up to seven in number for their starting point, instead of beginning with unity, is a conundrum too profound to be solved by the merely engineering brains

column, we find the same pleasant variety in the character of the decimal fractions, some of which run to only nine places of figures, and which, moreover, appear to have no definite symmetry or co-relation to each other. In the fourth column, when translated into millimeters, we still, as might be expected, see no apparent law governing the vagaries of figures, which again in some cases extend to the billionths place. The distances expressed thereby are about one twenty-fifth of one billionth linear inch, and only go to show

into merely whole numbers in the middle part and branching out into fractional ones toward the end. The first eight of these sizes actually run in a diminishing series with a uniform decrement of 20 ounces. This figure suddenly changes to 10 for a time and then to 5, 4, 2, 1, $\frac{1}{2}$ and $\frac{1}{4}$ respectively. It will be noticed that these decrements are not in uniform groups of any sort, nor have they a uniform difference. As far as can be seen the whole arrangement of the new standard purports to be especially adapted to the convenience of the sellers of iron, which is concentrated in these groups of round numbers of ounces. As, however, sheet iron is not sold by the ounce, but usually by the pound or ton, it is difficult to see wherein this convenience consists, especially when we look at the sixth column and see that the number of pounds per square foot represented by the different gauge sizes nearly all run in fractions, which in some cases are expressed by six places of decimals!

An examination of the seventh, eighth and ninth columns will still show nothing but a dreary array of decimals, having no apparent systematic relation to each other, which obviously is only natural in translating any gauge founded upon pounds and alleged inches into French metrical measurements.

It is, of course, possible that the superior wisdom of the inventors of this new gauge may be exemplified by its users finding practical benefit in the ounces per square foot feature above referred to, although the writer in his ignorance must confess to searching for it in vain. Even were this true, however, it must be remembered that such convenience would apply simply to black sheet iron, and that it would fail somewhat (at any rate to the extent of a few of the millionths of pounds expressed in the sixth column) when applied to sheet steel, whose specific gravity is slightly different. Still more would it fail as a practical working device if applied to galvanized iron or tin-plate, either of whose weights is quite perceptibly varied by the coating thereon.

When applied to copper, brass, zinc, nickel, silver, &c., these being ordinary commercial metals for which a gauge is frequently required, this weight per foot system utterly fails to the ground; and still further does a gauge of this kind prove itself entirely without system when applied to wire, not only when made of the other various metals in the market, but of iron itself. A careful study of this interesting law of the land caused the writer's wrath to wax hotter and hotter as the studying further progressed, until he had made notes for what he hoped would be a powerful philippic against its utter atrocity, not only from a strictly engineering point of view, but from the standpoint of ordinary business and common sense. Words, however, failed him and he was consoled only by the comforting fact that the text of the law, as given, with its accompanying table, would itself speak louder to the eye of the reader than would further mere words of criticism.

The table, Fig. 2, gives the dimensions in thousandths of an inch of 13 different American gauges, whose nominal size or number is shown in column A. In Fig. 3 will be found a table giving in like manner the dimensions of 12 different foreign gauges, with the numbers in its column A. These numbers are not continued beyond 50, although in a few cases the gauges themselves extend to a distance which might too far trespass

A	B	C	D	E	F	G	H	I	J	K	L	M	N
Gauge number.	American, New Legal Standard.	Brown & Sharpe, or B. & S. American Standard.	Washburn & Moen Mfg. Company.	G. W. Prentiss, Holyoke.	Trenton Iron Co., Trenton.	For music wire in America.	Edison, for copper wire.	For zinc sheets in America.	For twist drills and steel rods.	For drill and pit rods.	For screws in America.	For sheet iron in America.	For glass panes in America.
0000000	.500												
0000000	.468												
0000000	.437												
0000000	.406												
0000000	.375												
0000000	.343												
0000000	.312												
1	.281												
2	.255												
3	.230												
4	.204												
5	.181												
6	.162												
7	.144												
8	.128												
9	.116												
10	.101												
11	.090												
12	.080												
13	.071												
14	.064												
15	.057												
16	.050												
17	.045												
18	.040												
19	.035												
20	.031												
21	.028												
22	.025												
23	.022												
24	.020												
25	.017												
26	.015												
27	.014												
28	.012												
29	.011												
30	.010												
31	.008												
32	.007												
33	.009												
34	.008												
35	.007												
36	.006												
37	.004												
38	.003												
39	.003												
40	.003												
41													
42													
43													
44													
45													
46													
47													
48													
49													
50													

The above values all in inches.

Fig. 2.

of this age and country. It is probable, however, that to the political brains at Washington the scale in question seems a very ingenious affair, and therefore scientific.

Looking at the second column, it will be seen that the sizes determined upon are approximate only when expressed in the beautiful vulgar fractions given, which, by the way, enjoy a series of different denominators, having the one good point of a capacity to be resolved into the convenient (?) common denominator of 2560. For the fact, however, that some of the sizes mentioned, as $\frac{1}{285}$, $\frac{1}{2160}$, &c., do not consist of more than four figures in the denominator, a long suffering public should be profoundly thankful. Inspecting the third

how accurate our Government measurements are becoming. We will merely imagine the future international complications that may arise from some dispute between a French importer and an American customs officer seeking a strict construction of the law, when they attempt to measure some sea rusted piece of sheet iron and cannot agree by a few parts of a billionth, on account of one patriotically preferring the fourth column and the other the third.

In the fifth column a little daylight begins to appear, for here the figures representing the weight per square foot, in avoirdupois ounces, appear to run in certain series of round numbers in the upper part of the column, fading away

upon the editor's patience. From the same feeling of consideration for the editor I have not, in giving the inch values, carried out the decimals beyond three places of figures, although some of the gauge numbers run to millionths and even billionths of inches. In cases where these transcendental figures have been dropped a plus sign has been inserted, the third figure remaining normal, although the quantity would really have been better expressed in some cases (where followed by a figure larger than five) had such third figure been increased by one. For the practical purpose, however, of comparing the degrees of foolishness embodied, the three figures in question will doubtless be sufficiently accurate. The values given in the tables have been carefully compiled from a variety of sources, including both English and American engineering handbooks, catalogues of gauge, screw, wire and sheet makers, &c. Since preparing this article I have seen the description of a chart gotten up by Dr. S. S. Wheeler, in which he has plotted a graphical comparison of all the principal gauges. I have not yet been fortunate enough to see a copy but, knowing the author, have no doubt that it is a valuable addition to the literature of this subject.

An inspection of column A will show the absurdity (for any new gauge at any rate) of using groups of ciphers in advance of unity. The first group given can easily be remembered by thinking of Wordsworth's "We-are-seven, Conway-dwelling, cottage-girl, and has the advantage of requiring counting to identify it—thus preventing undue haste. In practical use it is probably pronounced number seven naught. In column B we see again our glorious national standard, as referred to upon a previous page. In column C we have the real "American gauge," so called, which is largely used for measuring sheet brass and sometimes for brass wire. The best thing that can be said of it is that it is the least bad of the whole lot, being scientifically designed so that its measurements will plot a parabolic curve with a uniform reduction of 11 per cent. between each consecutive size. It is thus better proportioned to meet the generality of sizes required than are the other ones, but it has many of the faults common to them as, e. g., being retrogressive, starting with four naughts, being expressed in odd thousandths, and even millionths, of the English inch, &c. The notch gauge in actual use for measuring these values is a beautiful tool—as might be expected of a product of the eminent engineering firm who designed it and whose name it bears.

In columns D, E, F and G we have other arbitrary standards, the first three of which seem to bear a close relation to each other. Possibly they may have, long ago, been evolved from some common source by the interesting copying process of measuring old worn out gauge notches to make new ones by. The music-wire gauge shows a decided change of tune, being the first with progressive numbers yet brought to our notice, though apparently being just as unsystematic as all the rest.

In column H we have another progressive gauge whose figures, regarding $\frac{1}{1000}$ inch as a unit, are the respective square roots of 1000 times the gauge number in column A. This probably may be convenient to electricians, some of whom compare all cross sections of their wires by a special unit, the "mil," which is a denomination of a sort of a special "circular square measure," so

to speak. The particular gauge numbers selected, however, do not appear to run up with a uniformly increasing increment, as is shown by the series 3, 5, 8, 12, 15, &c. This gauge, as will be seen in the lower half of the column, advances by fives to 50 and goes beyond in the same way to 100; thence to 200 the advance is by tens, and after that by twenties up to 360.

In column I we have another progressive gauge which appears to be a

and Z .413 inch. The increments between are neither uniform nor uniformly increasing, but run in a sort of a wild-cat series somewhat thus: 4, 4, 4, 4, 7, 4, 5, 9, 5, 14, 7, 11, 7, &c., with various other numbers interpolated.

In column L we have a progressive gauge for measuring American screws which seems to be founded upon nothing and to start nowhere, except that its increments are approximately .018 each. In column M we have a retro-

A	O	P	Q	R	S	T	U	V	W	X	Y	Z
Gauge number.	English Imperial Standard.	Birmingham, or Stubs, or English Standard.	Birmingham, for sheets, not iron or steel.	Birmingham, for iron sheets.	Lancashire, one of Holtzappels.	Warrington, or Rylands.	Old English, for brass, &c.	Needle wire in England.	Music wire in England.	Whitworth's English Standard.	French, Gauge de Limoges.	French, for galvanized iron.
0000000	.500	.....	.....	.....	.....	.500	.....	.....	.....	.....	.....	.....
0000000	.484	.....	.....	.....	.....	.488 +	.....	.....	.....	.....	.....	.....
0000000	.432	.....	.....	.....	.....	.437 +	.....	.....	.....	.....	.....	.....
0000000	.400	.434	.....	.....	.....	.408 +	.....	.....	.....	.....	.....	.....
0000000	.372	.425	.....	.....	.....	.375	.....	.....	.....	.....	.....	.....
0000000	.348	.380	.....	.....	.....	.343 +	.....	.....	.....	.....	.....	.....
0000000	.324	.340	.....	.....	.....	.328	.....	.....	.....	.....	.....	.....
1	.300	.300	.004	.312 +	.227	.300	.045	.....	.001	.017 +	.023 +	.....
2	.276	.284	.005	.281 +	.219	.274	.042	.....	.002	.022 +	.027 +	.....
3	.252	.259	.008	.250	.209	.250	.035	.....	.003	.024 +	.031 +	.....
4	.232	.238	.010	.234 +	.204	.229	.032	.....	.004	.031 +	.035 +	.....
5	.212	.220	.012	.218 +	.201	.209	.028	.....	.005	.035 +	.039 +	.....
6	.192	.203	.013	.203 +	.198	.191	.023	.....	.006	.039 +	.043 +	.....
7	.176	.180	.015	.187 +	.195	.174	.022	.....	.007	.044 +	.047 +	.....
8	.160	.165	.018	.171 +	.192	.159	.020	.....	.008	.048 +	.051 +	.....
9	.144	.148	.019	.156 +	.191	.146	.018	.021	.....	.009	.053 +	.055 +
10	.128	.134	.024	.140 +	.190	.133	.013	.022	.010	.057 +	.059 +	.....
11	.116	.120	.029	.125	.189	.117	.014	.023	.011	.066 +	.068 +	.....
12	.104	.109	.034	.112 +	.185	.100	.013	.025	.012	.070 +	.070 +	.....
13	.092	.095	.038	.100 +	.180	.080	.012	.028 +	.013	.075 +	.078 +	.....
14	.080	.088	.041	.087 +	.177	.079	.010	.028	.014	.079 +	.086 +	.....
15	.072	.072	.047	.075	.175	.069	.009	.030	.015	.084 +	.094 +	.....
16	.064	.065	.051	.062 +	.174	.062 +	.008	.032	.016	.088 +	.106	.....
17	.056	.058	.057	.058 +	.169	.053	.007	.033 +	.017	.112	.118	.....
18	.048	.049	.061	.050	.167	.047	.005	.035	.018	.134	.134	.....
19	.040	.042	.064	.043 +	.164	.041	.004	.038	.019	.156	.154	.....
20	.036	.035	.067	.037 +	.160	.036	.003	.042	.020	.177	.172	.....
21	.032	.032	.072	.034 +	.157	.031 +	.003 +	.002	.....	.201	.193	.....
22	.028	.028	.074	.031 +	.152	.028	.029 +	.....	.022	.222	.213	.....
23	.024	.025	.077	.028 +	.150	.....	.027	.....	.024	.244	.232	.....
24	.022	.022	.082	.025	.148	.....	.025	.....	.....	.....	.....	.....
25	.020	.020	.095	.023 +	.146	.....	.023	.....	.....	.....	.....	.....
26	.018	.018	.103	.021 +	.143	.....	.020 +	.....	.026	.....	.....	.....
27	.016 +	.016	.113	.020 +	.141	.....	.018 +	.....	.....	.....	.....	.....
28	.014 +	.014	.120	.018 +	.138	.....	.016 +	.....	.028	.....	.....	.....
29	.013 +	.013	.124	.017 +	.134	.....	.015 +	.....	.....	.....	.....	.....
30	.012 +	.012	.126	.015 +	.125	.....	.013 +	.....	.030	.....	.....	.....
31	.011 +	.010	.133	.014 +	.118	.....	.012 +	.....	.....	.....	.....	.....
32	.010 +	.009	.133	.012 +	.115	.....	.011 +	.....	.032	.....	.....	.....
33	.010	.004	.145	.....	.111	.....	.010 +	.....	.....	.....	.....	.....
34	.008 +	.007	.148	.....	.109	.....	.008 +	.....	.034	.....	.....	.....
35	.008 +	.005	.158	.....	.107	.....	.009	.....	.....	.....	.....	.....
36	.007 +	.004	.167	.....	.105	.....	.007 +	.....	.036	.....	.....	.....
37	.006 +	.....	.....	.....	.102	.....	.006 +	.....	.....	.....	.....	.....
38	.006	.....	.....	.....	.100	.....	.005 +	.....	.038	.....	.....	.....
39	.005 +	.....	.....	.....	.098	.....	.005	.....	.....	.....	.....	.....
40	.004 +	.....	.....	.....	.096	.....	.004 +	.....	.040	.....	.....	.....
41	.004 +	.....	.....	.....	.095	.....	.....	.....	.....	.....	.....	.....
42	.004	.....	.....	.....	.091	.....	.....	.....	.....	.....	.....	.....
43	.003 +	.....	.....	.....	.086	.....	.....	.....	.....	.....	.....	.....
44	.003 +	.....	.....	.....	.084	.....	.....	.....	.....	.....	.....	.....
45	.002 +	.....	.....	.....	.080	.....	.....	.....	.045	.....	.....	.....
46	.002	.....	.....	.....	.078	.....	.....	.....	.....	.....	.....	.....
47	.002	.....	.....	.....	.076	.....	.....	.....	.....	.....	.....	.....
48	.001 +	.....	.....	.....	.073	.....	.....	.....	.....	.....	.....	.....
49	.001 +	.....	.....	.....	.070	.....	.....	.....	.....	.....	.....	.....
50	.001	.....	.....	.....	.067	.....	.....	.....	.050	.....	.....	.....

The above values all in inches.

Fig. 3.

little more systematic than some of the others, as the sizes are expressed in whole thousandths, and run with a not wholly crazy series of increments, though why near the end of the table the measurements should jump suddenly from $\frac{1}{2}$ inch to 1 inch between two consecutive numbers, and this for measuring sheets as thin as zinc is usually made, is not quite comprehensible. Neither is it apparent why it starts where it does, or for that matter, why it goes on, or stops, or is.

In columns J and K we have two more arbitrary and retrogressive gauges with no special features of interest. They both continue onward in the same style to No. 60. The drill-rod gauge is thereafter continued further, as a sort of supplement, in a progressive form, with letters for names instead of numbers, A representing .234 inch

gressive gauge used by some of the large sheet iron manufacturers, but, like most of the others, the question why it did not die before it was born will remain one of the conundrums of the ages. Its comparatively slight difference from the Birmingham gauge in common use must make it extremely inconvenient in practice. The next gauge, in column N, is a progressive one, and is, as far as I know, the only one used by glass manufacturers. Its numbers, like several of the others, are not consecutive and certainly seem to skip around in a rather lively fashion. They appear to be without any particular definiteness, either in position or in relative measurements. In column O in the next table (Fig. 3) we have a retrogressive gauge which is, I believe, the only legally standardized one in England, it having been adopted by the

Board of Trade some years ago. It seems to be founded upon the older gauges somewhat evened up, so to speak, but has, as far as I know, no special relation to anything else in heaven or on earth.

Column P represents the well-known Birmingham, or B. W. G., or Stubs, gauge, which is almost always referred to (by some or any or all of these names), in this country at least, when wire and iron and steel sheets are designated by number, although brass wire is sometimes, as before stated, measured by the Brown & Sharpe gauge. The gauge in question is often referred to in this country as "English standard," these words sometimes being stamped upon the gauges themselves, even in the factories of the best makers. This is evidently a misnomer, in view of the fact that England seems to have a dozen or so standards, one of them (not this one) being legalized, as before mentioned.

In columns Q, R, S, T, U, V and W we have another pestilent brood of gauges starting and ending nowhere in particular, all different, all retrogressive and all belonging apparently to the class of literature the reading of which might have made Carlyle so cynical. It will be noticed that no less than three of the gauges in this table enjoy the adjective "Birmingham," and the names of the others are rather uncertain some being derived from places and some from people. In gauge nomenclature it may be observed that, besides having one name for several different things, the same thing has several names, as shown by more than one of the instances given. The Lancashire gauge, shown in column S, goes on beyond the figures tabulated to No. 80, which is .013 inch in size. It then has a supplementary progressive series named by letters from A to Z, the same as does the gauge already described in column K. After that, however, it indulges in a certain vagary by starting with No. A1, whose value is .420 inch, and onward alphabetically to No. H1, with a value of .494 inch.

In column X may be seen the first glimmer of common sense yet appearing as recorded by history in the industry of gauge inventing. Previously, everything had been allowed to grow up of itself in the most haphazard manner, but here we see the work of the practical mind of Sir Joseph Whitworth, who, as soon as he tackled the subject, hit upon the obvious and only sensible way, in a country using the English inch, of designating the small sizes in question. This was, of course, to express them in inches, like other measurements used in mechanical work, which he did while retaining the old word "number" as a prefix—probably with a view of catering to the prejudices of a gauge using people. This gauge in its complete form extends onward beyond the table to No. 100, increasing by fives; thence to 120 by tens; thence to 180 by fifteens; thence to 300 by twenties; and thence to 500 by twenty-fives. This progression, it will be noticed, is not quite uniform in character, nor is the progression in the lower part of column X, where the increment of two suddenly changes to five beyond No. 40. This, however, may be forgiven, as a gauge of the kind in question is not limited to any particular numbers, it being perfectly logical to insert or omit, as may happen to be required for the particular work in hand. The system always remains the same, the sum expressed by the number agreeing with the quantity of thousandths of inches involved. Just how

much this gauge is used in England I do not know, but it is difficult to see why it has not, from its inherent merits, become popular both there and here.

In columns Y and Z we have two French gauges, both of which are progressive, but which have the usual non-relation to each other, or to any other principle, person or thing. It is but fair to state, however, that when expressed in millimeters (which are not given in this table, in the interests of uniformity) they do not have so much of the ragged-edge effect as appears in the table. The progression, though, is not very uniform, and the actual sizes are in two places of decimals—that is, in hundredths of a millimeter No. 0 being, in the Jauge de Limoges, .39 mm.; No. 5, .90 mm., &c.

In addition to the 25 gauges given in the tables there are a few odd ones, not so much used, which need not be given in detail. One of these is the French so-called millimeter gauge for iron rods, &c., which starts at No. P, equaling 5 mm.; followed by No. 1, 6 mm.; No. 2, 7 mm.; and thence onward, numerically, to No. 30, equaling 100 mm. The increments, however, are not uniform, being represented by 1 mm. up to No. 16, and then increasing by steps of various sizes. Another gauge, also French, is used for zinc sheets, and is almost like the zinc gauge given in column I, varying, however, in some of its higher numbers.

Still another gauge is the German millimeter, so called. This is founded upon the same correct idea as is the Whitworth, No. 1 representing one mm., No. 2 two mm., No. 3 three mm., &c. Practically, however, its sizes would obviously be too large and too far apart for ordinary thin sheet metals or wire. Besides those above cited there are a German, a French and an English screw gauge, and a German rivet gauge, about which I have obtained no information. Among the curiosities of gauge literature may be cited a hoop-iron gauge, about which I have read somewhere but have mislaid the specification. It, as I remember, playfully runs its numbers in reverse order part way through the scale, each having a small circle (like a degree mark) printed after it. It then duplicates these numbers in natural order without the mark. Just what the sizes are I do not recollect, but practically hoop iron is, I believe, nowadays sold by the B. W. G. Another curiosity in the gauging business is to have no gauge at all, as is the case in measuring tin-plate, whose thickness is commercially known by such names as Taggers when anywhere from .004 inch to .008 inch; as IC from .008 inch to .014 inch; as IX from .013 inch to .017 inch; as IXX from .015 inch to .019 inch, &c. It will be noticed that these numbers lap each other in most cases, so that the same sheet might be called by either of two of the names given. There is, however, no attempt to measure this thickness, either by makers or users, it being guessed at by weighing a box of plates and knowing the number of sheets therein, these usually varying individually to a considerable degree in any one box. The sorting, which is generally necessary, is done by shaking each sheet flatwise and judging of the thickness by the stiffness and weight.

A supplementary set of sizes, lying between any of the gauge numbers of any of the 25 gauges mentioned, are in practical use, and are known by the following names. No. so-and-so easy, or bare, or scant, or loose, or light. Also No. so-and-so full, or tight, or

heavy. Still another set of sizes are represented by these same adjectives with the word "rather" as a prefix; and still another set by the use of fractions, No. 15 $\frac{1}{2}$, &c., the $\frac{1}{2}$ serving as a suffix to, and in some way modifying, a regular gauge number. Furthermore, the people who use the above adjectives, with or without their qualifying adverb, and who use the fraction spoken of, do not generally make it very clear as to whether the scantness, or fullness, or increase expressed by the fraction, refers to the actual size of the gauge notch in question or to the numbers designated. Such indefiniteness in the case of retrogressive gauges may of course reverse the meaning intended, and therefore the occupation of receiving and filling orders for sheet metal, rods, nails, rivets and wire becomes a somewhat puzzling one to say the least. A customer merely states that it is to be No. so-and-so, qualified occasionally perhaps by the adjectives, &c., just mentioned, but says nothing about what gauge is meant, and how the adjectives and fractions are intended to be applied, nor whether he is depending upon duplicating material which has been measured by some old gauge with worn out notches. This is no fancy picture, but merely a portrayal of some of the misery daily occurring in commercial life.

A thorough discussion of some possibly successful and popular remedy for the evils indicated in this article, and a remedy, moreover, that should be international rather than merely American, might well require a volume to itself. In the limited space herein at command, therefore, I will only say that the subject is constantly attracting more and more interest among engineers and other scientific men, with a probable result of some definite standard methods of dealing with the measurements in question being settled upon in the not too far off future. Were it an Anglo-American question only there would be but little difficulty in popularizing the Whitworth gauge, this being, I think, the only logical system where the English inch is the unit of measurement for larger sizes. Such gauges would be made not only for all varieties of sheet metals, wire, rods and bars; but for paper, cloth, leather, glass, &c., one system answering perfectly for all. The apparent unnecessary magnitude of a gauge comprising every $1\frac{1}{3}\frac{1}{3}$ inch, say, from 1 to 1000, can be easily overcome by preparing notched gauges for particular trades and industries, containing only such sizes as are in common use therein. Each industry or group of industries needing about the same range could thus have as small and simple a gauge as possible, with all superfluous numbers omitted; and any gauge would absolutely agree with any other, whenever they happened to have any numbers in common.

The real difficulty in this matter, however, looms up when we attempt to contrive an international gauge, which will be equally welcome to the peoples of the earth using the English inch and the French meter. It has been suggested that a gauge founded upon a hundredth of a millimeter as a unit, each number to express the quantity of these units embodied, would answer perfectly well for the whole world's use, and this view is advocated by a number of scientists in this country as well as abroad. Such a scheme has the disadvantage for England, America and Australia of not being easily translated into and compared with our standard measurements. It has, however, the advan-

tage of having a unit of about $\frac{1}{16}$ inch, which for very small sizes is better than the $\frac{1}{16}$ inch unit of the Whitworth gauge. Whichever of these two most feasible schemes may be adopted, the commercial and engineering world will certainly be happier and better therefor. One strong point in favor of the general principle herein advocated is that any of the notched gauges (which form seems to be popularly demanded) founded thereupon can be easily calibrated and kept in order by the ordinary micrometers such as are now in use in all machine shops, measuring by thousands up to 1 inch, or similar ones arranged for the metric system.

This very important subject is now being looked into by a committee of the American Society of Mechanical Engineers, which will probably co-operate with committees from the other great national engineering societies. Interesting discussions have for some years past taken place in the various society conventions, in one of which the adoption of a $\frac{1}{16}$ inch unit for a numbered gauge was proposed and strenuously advocated by the present writer, he at that time (May, 1889) being ignorant that Whitworth had previously done the same thing and also had put it in practical shape. Nobody appears to have ever seriously opposed this scheme, but there seems yet to be the inertia of a heavy mass of conservatism and indifference to overcome. Active forces have, however, been set in motion and it is earnestly to be hoped that before the twentieth century shall have dawned the civilized world will have forgotten its past incomprehensible foolishness in regard to the measuring of its smaller dimensions; and that some gauging system as simple and definite as it is universal will have been adopted as merely the embodiment of common sense applied to common things.

The New Norton Can Factory.

The can factory which has just been erected at Maywood, Ill., by Norton Brothers, is a model factory. So many excellent ideas have been embodied in its construction that it is well worthy of extended description. While it has been built for a special purpose, there are many points in connection with it which will be found of value by manufacturers in other lines. It is somewhat difficult to enumerate all the purposes which have been kept in view by those who planned the factory, but among them are the thorough distribution of natural light, the highest possible comfort of the help, the economical handling of materials, the absolute safety of dies and patterns, the reduction of the fire risk to a minimum, the prevention of stoppages from break downs, close supervision of all departments from the central authority, &c. How well these various matters have been provided for, as well as many other important details in manufacturing economy, will appear in the course of this description.

In the first place, the owners of this establishment have not been hampered by lack of room. They were therefore able to spread out instead of building up in the air. The factory is only two stories high, but it is 243 feet square. As will be seen by reference to the accompanying plans, it is built with an open space or court in the center, which is 101 feet square. The various floors of the factory, therefore, are 71 feet in width, and aggregate over 120,000 feet of floor space. The walls of both the

exterior and the court side are pierced with windows, placed only about 2 feet apart. In this way, as the ceilings are high, natural light easily penetrates to the center of every room even on the gloomiest days. The basement of the building is unusually high, as it is not used for manufacturing purposes, the floor of the first story being over 4 feet from the ground level. This affords room for the passage of shafting or for access to pipes, and also enables the dressing rooms in the courtyard to be constructed with their roofs below the level of the windows of the first floor, so as not to obstruct the light. The kilns which are seen along one side of the building are used for drying painted

venience of employees should be carefully studied by those who employ them. In the arrangement of this factory, therefore, the utmost consideration has been given to the care of the help, with a view to promoting their health and comfort, instilling into their minds the love of order, inculcating cleanliness, &c. The approach to the factory is therefore made inviting. A fine lawn is arranged in front of it, in the center of which is a fountain surrounded by a large basin holding 125,000 gallons, which serves as a reservoir for fire purposes. The employees pass through an arcade, as shown on the plan, into the court. Here they find nicely arranged dressing rooms with rows of wardrobes,

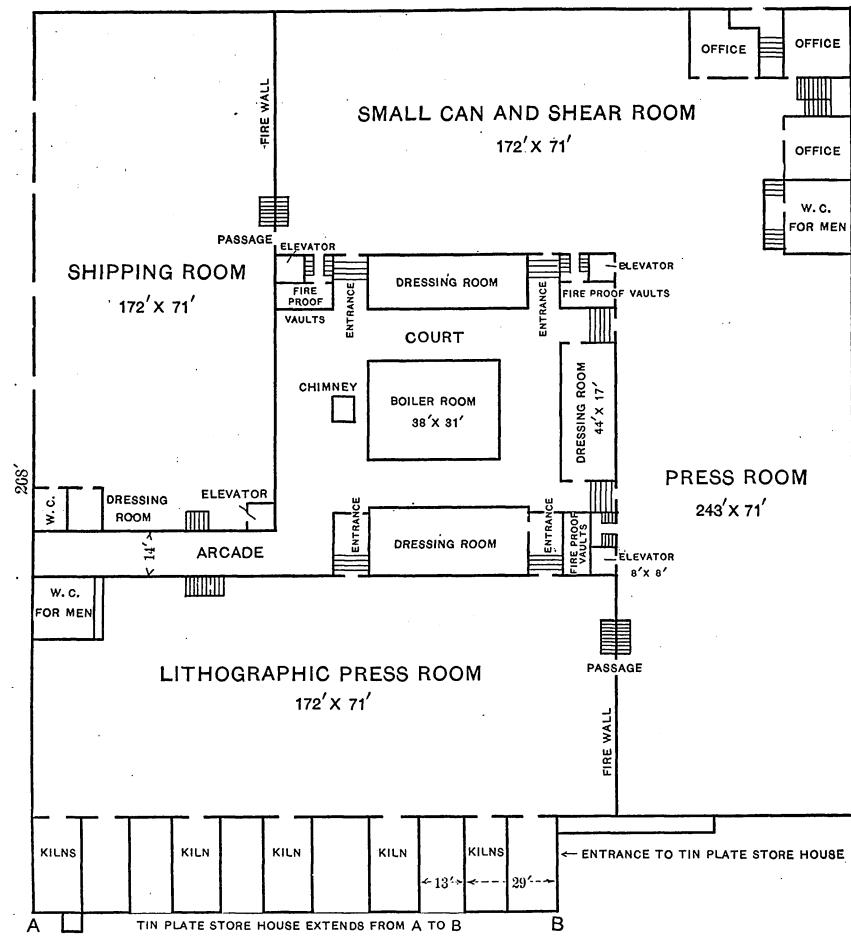


Fig. 1.—Plan of First Floor.

NORTON BROTHERS' FACTORY AT MAYWOOD, ILL.

and japanned packages, lithographed work, &c., and are built in two tiers on the roof of a tin plate storage house. This house is built of brick, with a roof of 12-inch steel beams spanned by brick arches, has a cement floor and is heated by hot blast to keep the tin plate from sweating and rusting. The roof of the tin plate storehouse also comes below the level of the windows of the first floor, so as not to obstruct light, and the kilns above are arranged in separate blocks for the same purpose, instead of extending in one unbroken line. The interior walls and ceilings are whitewashed, except in the lithographing and painting rooms, in which the ceilings are painted to prevent dust from falling on the work. The courtyard walls are also whitewashed. This shows the pains taken to secure the utmost amount of natural light.

It has long been the theory of Norton Brothers that the comfort and con-

venience of employees should be carefully studied by those who employ them. In the arrangement of this factory, therefore, the utmost consideration has been given to the care of the help, with a view to promoting their health and comfort, instilling into their minds the love of order, inculcating cleanliness, &c. The approach to the factory is therefore made inviting. A fine lawn is arranged in front of it, in the center of which is a fountain surrounded by a large basin holding 125,000 gallons, which serves as a reservoir for fire purposes. The employees pass through an arcade, as shown on the plan, into the court. Here they find nicely arranged dressing rooms with rows of wardrobes,

Special attention has also been paid to heating and ventilation. The entire factory is heated by hot blast, a steam coil being placed in each department through which a fan forces a constant supply of fresh air, provision being made to exhaust the impure air. The pressure of the heated air, however, is such as to create an outward flow if a door or window is opened, so that there are no drafts. The care which has been given to the comfort of the employees is highly appreciated, and Norton Brothers believe that the money spent for this purpose has been well invested.

Referring to the plans it will be seen that two fire walls divide each floor into three compartments. These fire walls

across the vault from side to side. Wooden racks of heavy frame work are supported on the tracks by door hangers. The patterns hang on pins on the racks, filling both sides. The vault is wide enough to permit two racks to hang on each track with a passage of the width of a rack between them. A rack can thus be pulled out into the passage to be examined. These racks are systematically indexed, so that a pattern can be instantly located.

A system of railroad tracks for narrow trucks connects this factory with the other portions of Norton Brothers' plant. The cars on these tracks are drawn by an electric locomotive operated by storage battery. The buildings

engine room is in a portion of the factory opposite the boiler house and contains two 150 horse-power Ball compound engines, so connected that they can be run together or separately. Either will do the work required. A jack shaft is used, from which belts are run to line shafting in one department and to dynamos which supply current for electric motors in other departments, no fire walls being pierced by shafting. The three-wire Edison electric system is used, by means of which incandescent arc and power service are secured from the same source. About 100 horse-power is used for mechanical purposes. The lighting plant consists of 70 arc lights and 560 incandescents, the arc lights being used for large open spaces and incandescents for work around machines and benches. The electric plant is not dependent upon the power in this factory alone, as it can be operated from the power plant of the tin plate works if that should become necessary at any time. This interchangeability of power is also extended to the pumping plant by which water is forced into towers at the corners of the court for operating the sprinkling system. The pumps take steam either from the boilers of this factory or from boilers in other parts of the works.

An admirable system of telephoning has been installed. The several departments of the new factory, as well as the older portions of the plant are connected with a central exchange in the office connecting the 20 telephones. Thus the superintendent can sit at his desk and be put in instant communication with the foreman of any department, with two separate foremen when it becomes necessary for a three-cornered conference or investigation. The local wires are further connected with the main office in Chicago and with the whole Chicago telephone service and with the long distance telephone to the leading cities of the country.

The tin scrap made in this factory is utilized on the premises. As rapidly as it accumulates it is collected at a baling press and compressed into small bulk, after which the bales are taken to the foundry and the metal is run into sash weights. The sash weight foundry was started some two years since and has proved to be a very satisfactory channel through which to convert tin scrap into a marketable product.

The products of the new factory cover all kinds of packages made of tin plate except fruit cans, a separate building, heretofore referred to, being devoted to the manufacture of these by the Norton Automatic system. The machinery, therefore, comprises a very great variety of presses for cutting tin plate into the necessary sizes and shapes, gang presses being introduced wherever practicable. Machinery of original design, made in Norton Brothers' machine shop, is used for special operations; but there are, nevertheless, many styles of packages which must be made largely by hand, involving the employment of much skilled labor. In the lithographing and painting department the most elaborate decorations are designed and executed for packages requiring such treatment. Throughout the entire plant the visitor is impressed with the thoroughness with which everything has been done to make the factory as perfect a workshop as possible.

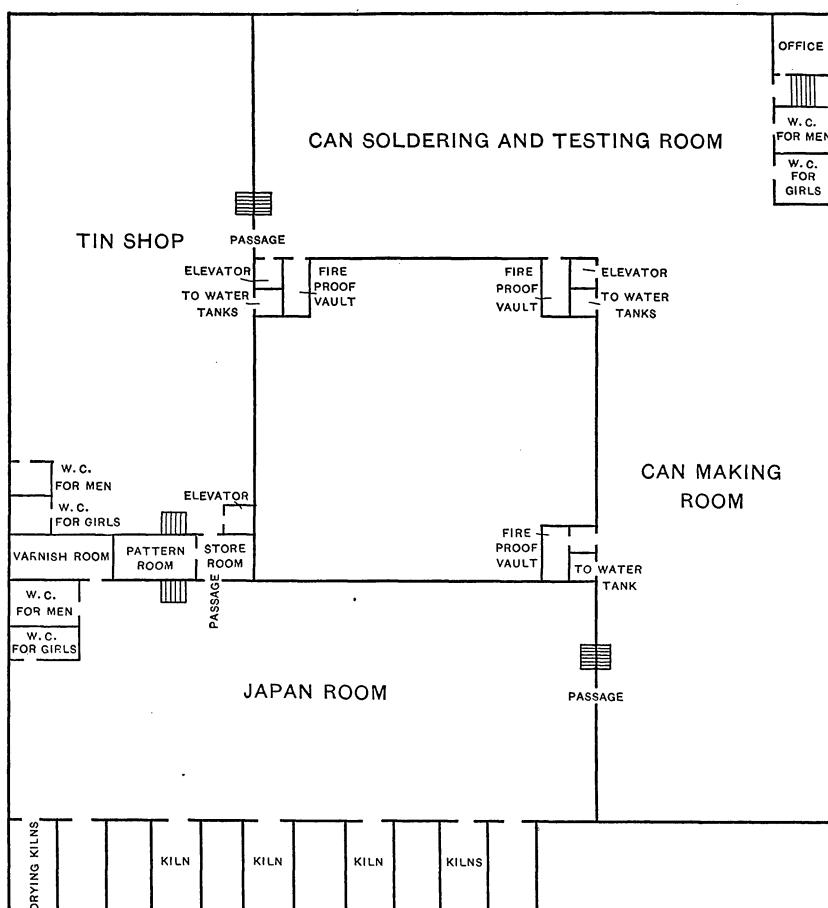


Fig. 2.—Plan of Second Floor.

NORTON BROTHERS' FACTORY AT MAYWOOD, ILL.

are pierced by doorways only. The doorways are guarded by sliding doors covered with metal, which are always open, but are weighted on an inclined runway, the weight being released by a fusible plug which melts at a low temperature. They will thus close automatically in case of fire. Automatic sprinklers are also placed throughout the entire building as an additional safeguard against fire. Elevators are placed in the corners of the court outside of the building. They are inclosed in brick shafts so that they will not form fire conductors. Fire proof vaults are built projecting into the court for the storage of dies and patterns, a great deal of room for such storage being necessary on account of the variety of work done. A very large fire proof vault is built in the second story immediately over the arched brick roof of the arcade. It is used for sheet metal patterns. The method of storing these is noteworthy. Iron tracks are hung from the ceiling

connected are the rolling mill and foundry, the tin plate factory and the fruit can factory, all in detached buildings. Tin plates are brought to the new factory on trucks loaded in the tin plate works, and they are then stored in the tin plate storage house or can be drawn on a hydraulic elevator and hoisted to either floor, whence tracks run through the several departments. The arrangement of the factory is such that from the time the tin plates are landed at a press the work goes constantly forward until it reaches the shipping room, from which it is loaded directly into cars on a track running by the side of the building.

The power for operating the machinery is furnished by two Babcock & Wilcox boilers, located in the boiler room in the court. One of these is held in reserve, each being capable of running all the machinery. Oil is used for fuel. It is stored some distance from the building and pumped in. The

The proportion of the ships using electric lights for navigating the Suez Canal during the last four years has been as follows: 1890, 83 per cent.;

1891, 88 per cent.; 1892, 90 per cent.; 1893, 92 per cent. The average time occupied in passing through the canal was in 1893: With the electric light, 19 hours 52 minutes; without the light, 31 hours 24 minutes. The time occupied in transit slowly, but steadily, decreases. Out of the 3341 ships which passed through the canal in 1893, 2300 had a draft of under 23 feet 4 inches, 985 drew between 23 feet 4 inches and 26 feet, and 56 had the maximum draft of 26 feet.

Western Foundrymen's Association.

The regular monthly meeting of the Western Foundrymen's Association was held Wednesday evening, November 21,

Table No. 1.

	Transverse strength.	Appearance fracture.	Shrinkage.	Contraction. Inch.	Fluidity. Inches.	Chill. Inch.	Size of bars. Inches.
1 { 1st	1,670	slight flaw.	0.7	0.156	5 ¹ / ₂	0.19	1.11
1 { 2d	2,190	solid.	1.6	0.156	5 ¹ / ₂	0.19	1.11
2 { 1st	1,720	slight flaw.	0.4	0.140	3 ¹ / ₂	0.14	1.13
2 { 2d	1,545	bad flaw.	1.7	0.140	3 ¹ / ₂	0.14	1.13
3 { 1st	1,840	slight flaw.	1.3	0.140	4 ¹ / ₂	0.16	1.09
3 { 2d	2,000	slight flaw.	0.6	0.140	5 ¹ / ₂	0.20	1.11
4 { 1st	2,320	solid.	1.1	0.140	6 ¹ / ₂	0.20	1.11
4 { 2d	1,970	slight flaw.	2.1	0.150	6	0.20	1.12
5 { 1st	1,600	bad flaw.	2.1	0.150	3 ¹ / ₂	0.19	1.11
5 { 2d	2,095	solid.	1.7	0.150	2 ¹ / ₂	0.19	1.09
6 { 1st	1,960	slight flaw.	1.6	0.125	4	0.09	1.09
6 { 2d	2,140	solid.	0.5	0.125	3 ¹ / ₂	0.11	1.11
7 { 1st	2,105	solid.	0.8	0.150	4	0.12	1.10
7 { 2d	1,890	slight flaw.	1.2	0.170	4 ¹ / ₂	0.12	1.11
8 { 1st	2,890	solid.	1.3	0.185	2 ¹ / ₂	All white.	1.13
8 { 2d	2,675	solid.	1.8	0.185	2 ¹ / ₂	All white.	1.13
9 { 1st	1,780	bad flaw.	1.1	0.150	6	0.14	1.12
9 { 2d	2,140	solid.	0.4	0.155	5 ¹ / ₂	0.14	1.13

at the Great Northern Hotel, Chicago, with the president, Geo. M. Sargent, in the chair. Those present were the following: Geo. M. Sargent, The Sargent Company, Chicago; Thos. D. West, Thos. D. West Foundry Company, Sharpsville, Pa.; C. A. Sercomb, Schwab & Sercomb, Milwaukee; W. C. Waterbury, Forster, Hawes & Co., Chicago; John S. Rowlands, J. I. Case T. M. Company, Racine; C. E. Louis, Forster Hawes & Co., Chicago; A. M. Thompson, Link-Belt Machinery Company, Chicago; John K. Mackenzie, Dickman & Mackenzie, Chicago; Geo. F. Wetherell, Preble Machine Works, Chicago; Thos. Smith, Dearborn Foundry Company, Chicago; E. H. Walker, Emerson, Talcott & Co., Rockford, Ill.; Jas. Fyfe, Pickands, Brown & Co., Chicago; Jas. A. Brady, Chicago Hardware Mfg. Company, Chicago; A. W. McArthur, Rockford Foundry Company, Rockford, Ill.; M. N. McLaren, Jr., E. P. Allis Company, Milwaukee; J. H. Dalton, Chas. S. Thompson, Walburn-Swenson Company, Chicago; Wm. M. Wing, Hoyt & Bro. Company, Aurora, Ill.; H. L. Hotchkiss, J. L. Hecht, Deering Harvester Company, Chicago; A. J. Oehring, W. W. Nessinger, Western Electric Company, Chicago; L. W. Lukers, O. T. Stantial, H. O. White, Illinois Malleable Iron Company, Chicago; John M. Sweeney, Chicago; W. N. Moore, Joliet Stove Works, Joliet, Ill.; P. S. Dingey, Armour Institute, Chicago; B. M. Gardner, Chicago. On motion the minutes of last meeting stood approved. The secretary read the following report of the Committee on Comparison of Round and Square Test Bars:

Report of Committee on Comparison of Round and Square Test Bars.

This committee was appointed at the July meeting of the association to investigate the matter of casting round test

bars on end, according to the method proposed by Thos. D. West of Sharpsville, Pa., as being preferable to the ordinary method of casting square bars flat.

We have followed out our tests with the apparatus furnished by Mr. West and have been guided by his directions, as to details of pouring, &c., thus taking advantage of his experience. The different members have made independent tests, so that this report represents results obtained in several foundries.

Table No. 1 represents a series of tests, carried out to obtain the different properties described in a former paper of Mr. West's, read before the association, on his method of casting round test bars on end. These bars were cast two in a flask and poured from the same ladle of iron at the same time, and are accordingly grouped in pairs.

bars, there was 43 per cent. defective on account of flaws.

Table No. 3.

	Transverse strength.	Appearance of fracture.
1 { 1st round	1,850	flaw
1 { 2d round	1,970	solid
2 { 1st round	2,170	flaw
2 { 2d round	1,770	solid
3 { 1st round	1,990	solid
3 { 2d round	2,150	solid
3 { 1st round	1,790	flaw
3 { 2d round	1,560	flaw
3 { 3d square	1,790	solid
4 { 1st round	2,090	solid
4 { 2d round	1,860	solid
4 { 3d square	2,000	solid
5 { 1st round	2,100	solid
5 { 2d round	1,920	flaw
5 { 3d square	2,100	solid
6 { 1st round	2,280	solid
6 { 2d round	2,030	solid
6 { 3d square	2,125	solid
7 { 1st round	1,910	flaw
7 { 2d round	2,090	solid
7 { 3d square	2,020	solid

Table No. 4 shows another series of tests, comparisons being made with square and round bars, as in Table No. 3. In this series the per cent. of square bars defective from flaws is 18 per cent., while of the round bars it is 5¹/₂ per cent.

Table No. 4.

	Transverse strength.	Appearance of fracture.
1 { 1st round	2,000	slight flaw
1 { 2d round	1,920	flaw
1 { 3d square	2,060	solid
2 { 1st round	1,980	flaw
2 { 2d round	2,200	solid
2 { 3d square	2,280	solid
3 { 1st round	1,730	flaws
3 { 2d round	1,940	solid
3 { 3d square	1,920	solid
4 { 1st round	1,780	slight flaw
4 { 2d round	1,720	flaws
4 { 3d square	1,800	solid
5 { 1st round	1,940	flaw
5 { 2d round	1,840	solid
5 { 3d square	1,960	solid
6 { 1st round	1,940	flaw
6 { 2d round	1,870	solid
6 { 3d square	1,870	solid
7 { 1st round	1,740	flaw
7 { 2d round	1,520	bad flaw
7 { 3d square	2,130	solid
8 { 1st round	1,500	bad flaw
8 { 2d round	1,800	solid
8 { 3d square	1,820	solid
9 { 1st round	1,920	solid
9 { 2d round	1,600	solid
9 { 3d square	1,600	flaw
10 { 1st round	1,880	solid
10 { 2d round	2,000	solid
10 { 3d square	1,720	bad flaw
11 { 1st round	2,010	solid
11 { 2d round	2,120	solid
11 { 3d square	1,980	solid

Still another series of tests, made by one of the committee, comparing the square and round bars, showed the percentage of poor bars, in round bars cast on end, to be much greater than in square bars cast flat, but unfortunately the record of his tests was mislaid and we cannot show the actual figures.

Mr. West's plan for determining contraction, fluidity and chill we find to be good. His plan for shrinkage, as shown in table No. 1, and in about 100 other bars, not enumerated, shows no uniformity and is impractical. We are obliged to say that we cannot see anything in the foregoing results that would warrant us in indorsing the round bar, cast on end, as against the square bar, cast flat, for obtaining the transverse strength, which is the most important test in ordinary foundry practice. The principal difficulty met with is the frequent appearance of flaws (probably due to method of casting) which does not seem to occur to the same extent in square bars, cast flat. These flaws do not appear to be blow holes or cavities, but rather slag, or sand flaws. Respectfully submitted for the committee.

O. T. STANTIAL, Chairman.

In Table No. 3 are shown transverse tests, comparing square bars and round bars. Each set of three bars was cast from the same ladle of iron, the square bars being cast flat in the ordinary way and the round bars on end. In this series the square bars were all perfect, showing no flaws, while of the round

John M. Sweeney: This report should have embodied in it a statement as to what was the length of the bars. At some time these tables might be used for comparison in the matter of strength; if I am not mistaken, they do not state what the length of the center is.

H. L. Hotchkiss: The length was 12 inches between supports.

J. M. Sweeney: Has any member of the committee a reason to suggest why the round bars show so much greater percentage of flaws? Ordinarily the bars cast on end would be the freest from flaws. Why is this difference?

J. L. Hecht: We do feel in doubt as to the cause of the flaws. We could not trace their origin to anything particular. It was speculation on our part.

J. M. Sweeney: The bars cast on end should be the freest from flaws. The result is contrary to what would be the accepted view of the case, and there must be some reason for it.

W. N. Moore: Some five or six meetings ago when this matter of test bars first came up I remember I advocated casting round test bars and was very certain that we would get uniform results from them. The evidence of the experiments seems conclusive that the results are not trustworthy. It is a very interesting question, why these square bars poured flat from the same iron and the same man pouring are cleaner than the bars poured on end. According to all the theory of foundry practice that I have ever learned these round test bars were cast under the most favorable conditions for producing the most favorable castings; and the result is that they did not do so at all.

T. D. West: Before sending my appliances on to the committee I made a great many tests, and continued to do so after the appliances had left my hands. I invariably obtained good results. It was not long after the committee had the appliances before I heard from their chairman, Mr. Stantial, a very unfavorable report. Of course it might have been that my own success was due to my carelessness. We all know that it is not the big things, but the little things, that have to be looked after. I thought I would try a young boy, an apprentice, and I had him make me some bars without any special instruction, and in doing so I obtained very bad results. I found that the bars contained flaws and I followed him up to see what he was doing. I found that his ladle struck the top of the grate. I found that in making his pattern he secured some parts more tightly than others. Although I had several plans in view, I adopted the method which I sent to the committee because it was very easy to break the bar from the gate. The use of a hammer in breaking the bar from the gate is liable to cause a flaw. Since learning of the committee's report I became satisfied that some other method would have to be adopted. I had the idea at the start of trying a swirl gate; but as I had obtained such good results with my other method I allowed it to go as it was. Of course, if there is any dirt in the joint it will mix with the iron coming down. I have raised the gate in this second system. It did not arrive in time for me to make the tests I had hoped to report this evening. The metal goes in on a whirl. With this new plan of gating the difficulty in the matter of flaws will be overcome. The only fine point now with this system is starting to pour. It also depends on the nature of the iron a good deal. I found this afternoon with Mr. Stantial, at his works, that the gate had to be filed down, as it took the iron faster than

the molder could keep it up, owing to the extremely hot iron used in his foundry. A dry iron showed itself at the point of fracture.

J. M. Sweeney: The reasons that you have given for the flaws in the round bars cast on end, the method of pouring, &c., would equally apply to the bars cast flat.

T. W. West: It would equally apply to a degree; but in the flat bars the dirt would have a chance to spread out more and not confine itself to one point. In the round bar it generally collects in a body and is apt to roll against the side, and the friction there holds it.

J. M. Sweeney: In the tests you made did you find any flaws?

T. W. West: I cannot say that I found any flaws. It was only after I received the report from the committee that I was surprised to hear of the percentage of flaws that they found. This later gate will bring any dirt up to the top. I had several different forms of gates made and tried with a view of reducing the area so as to have no rapping or breaking.

C. A. Sercomb: I understand that you say the flaws were all sand flaws, and that there were no blow holes?

T. D. West: I understand so from the committee's report. They were simply little fine sand holes, and no blow holes.

J. M. Sweeney: I am interested to know why the bars cast on end show such a large percentage of flaws over the square bars cast flat. The reason that Mr. West gives is not sufficient, because the bars were molded by the same man. My opinion is that the gate area in these bars is not sufficient. The iron falls down a considerable distance and then turns around and runs the other way. It should not be necessary to put a swirl gate on so small a diameter of test bars. My judgment is that with the swirl gate you will find the sand at the center. Perhaps Mr. West may have tried different gate areas on the first bars shown here, but if I was searching for a reason and wanted to make the change it would be in the gate area.

A. W. McArthur: Do I understand that this is a final report from the committee?

O. T. Stantial: It is a final report on that apparatus. Since our report went in Mr. West has perfected what he calls his last apparatus, which we have not had time to thoroughly test. I must say that I agree with Mr. West that those flaws are caused by slag or sand, which is carried in with the iron in the form of gating which he has adopted in his first method. If we can overcome these flaws by any style of gating we shall get perfect bars, which he is confident of obtaining in his last method. We have not made enough experiments with the last method to report on it. The tests have been made hurriedly, but there appears to be merit in the last method. I think the point made by Mr. Sweeney is good.

J. M. Sweeney: I should like to know from Mr. Stantial how many of the 32 per cent. of the flaw test bars in Table No. 2 broke at the point where the force was applied.

O. T. Stantial: I have no record to show that. My impression is that they broke within $\frac{1}{2}$ inch of where the load was applied. There might have been a few that broke further away than that.

T. D. West: I generally find that they break near the point of pressure; if they break away from that it is not more than $\frac{1}{2}$ inch on either side. But

it is no reason why, because we find dirt at the point of fracture that the dirt is all there. It might be 1 inch away, and the leverage be sufficient to overcome the weakness.

J. M. Sweeney: In order to account for the round bar showing dirt at the point of fracture you must show some reason why the dirt always goes to the point of fracture. I think that your first plan is better than the last.

Mr. West: It is a better plan only in regard to breaking off the gate. We all know that the greatest danger of the dirt getting in is at the beginning. After we once get our gates filled then our chances for dirt are slight.

A. M. Thompson: A larger gate would have the effect of putting more dirt into the iron. We all know who have had anything to do with making clean castings that the principal object is to choke the gate in the first place to keep out the dirt. The iron goes right down to the bottom and it strikes the joint of the mold. There is always more or less loose sand about the joint of the mold and this has a tendency to start up. Then there is more or less dirt on the lip of the ladle which has always a strong tendency to fall in at the start. If there could be a method of carrying the dirt way through I think this system would get a clean test bar. The process of filling with this gate is so slow that the iron gets cold before it travels up and the dirt that enters flows on the top of the metal so long as the iron is hot. It goes to the side as the iron gets cold and stays there. At the same time a larger gate will let in more dirt at the start. If the method could be perfected so as not to allow any dirt to go in at the first pour it would be all right. The trouble with this bar is that it has a tendency to take up the loose sand at the joint.

A. W. McArthur: I have had some experience in making clean iron. Those gates are large enough, but the vertical gate should be as large as one of those bars. We have had good results with flat gates let in at the side.

P. S. Dingey: Mr. McArthur spoke of making inlets from the gate to the test bar to run in an upward direction, which makes me think of a little experience I had some time ago when I was connected with the M. C. Bullock Mfg. Company. We had to do the same thing to get some clean castings. We had tried all the foundrymen in Chicago. The castings were not test bars, but were what we called "trunks." They were for Willan's engines and had to be absolutely perfect. If there was so much as a pin hole in them they had to be thrown away. We had an upper floor pretty well filled with bad castings. A gentleman called on the firm who had worked in England on the same kind of engines and he said they had no trouble in making these trunks perfect. He told how to get them perfect and we adopted the plan, which is the same as Mr. McArthur has spoken of.

W. W. Moore: One trouble is that when the iron reaches those bars it is too cold. The enlargement of the main gate would probably help that some. The enlargement of the runners would also help it more. By the time those bars were half full the metal would be pretty well chilled down unless it were very hot when it entered. My suggestion would be to so arrange the runner area as to get the iron in there hotter. Whether or not this can be accomplished, and the dirt and flaws be entirely eliminated by enlarging the gate and runners, is a matter of experi-

ment and can hardly be determined by argument. An iron test bar cast in an upright position commends itself to me as I think it does to almost all of us. We are on the right track in making round test bars cast in an upright position.

The secretary offered the following names as candidates for membership in the association and they were unanimously elected members: Sloss Iron & Steel Company, Birmingham, Ala.; J. I. Case T. M. Company, Racine, Wis., and Irving M. Bean, Northwestern Iron Company, Milwaukee, Wis.

The Standard Automatic Safety Throttle Valve.

That there is an element of danger in the transmission and use of power is a fact well understood—varying in degree, of course, according to the perfection of equipment and the care exercised in its management. Improvements are continually being made

large manufacturing establishments are provided with a system of wiring and push-buttons, by means of which electrical signals may be transmitted to the engineer from any part of the premises at or near which an emergency may occur. This, if the engineer be within convenient distance of his throttle, will enable him to promptly begin shutting off steam. But this is a work of time, as with the modern type of engine, cutting off automatically, the throttle is carried wide open and it must therefore be screwed in the whole distance against the pressure of steam; which, as it requires from five to ten revolutions of the hand wheel, consumes considerable valuable time. There is another kind of emergency, entirely separate from the transmission system, in which the damage threatened is to the engine itself. In this case it may be important not only to shut off steam quickly, but to do so without the necessity for going too near the engine, when there may be imminent danger to life or limb. Dur-

necessary. Premising of course that it is located in place of the ordinary throttle, and that its dimensions as to the diameter of flanges and the distance between their faces being standard, make it interchangeable with any of the standard makes, its operation may be described as follows: Assuming the valve to be in the open position, as shown, steam passes as indicated by the arrows, from the steam pipe to the engine. It also passes by the small port seen in the upper part of the large piston to the outer face of the latter, where it exerts the same pressure per square inch as upon the opposite side. This would place the piston in equilibrium were it not that while the outer area is that of the full circle, the inner area is annular, it being reduced in extent by the sectional area of the valve stem, which is protected from pressure by the stuffing box. The piston and valve disks are therefore forced to the open position by the excess of pressure on the outer area of the piston, and are so held, so long

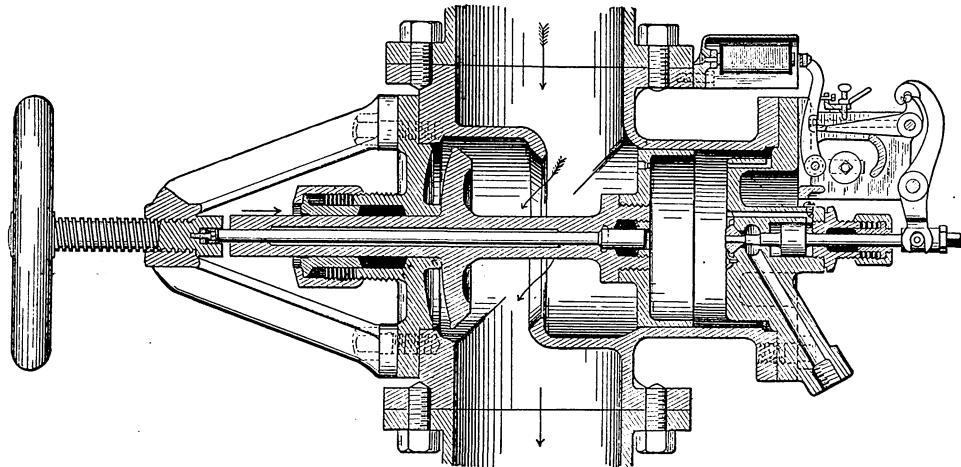


Fig. 1.—Sectional View.

THE STANDARD AUTOMATIC SAFETY THROTTLE VALVE.

in "safety devices"—that is to say, in devices for lessening the degree of danger. Some of these apply to the transmission system only, while others refer to the prime mover, of whatever character the latter may be, and are, therefore, of wider scope in their protective influence than those of the class first named. From the fact that so large a percentage of the power used is furnished by the steam engine, any real improvement in means for controlling the latter may be considered as well worthy the attention of power users, whether proprietors or those responsible for the management. Obviously the instantaneous stoppage of an engine in case of an emergency is practically impossible. To say nothing of the delay in shutting off steam, the momentum of the fly wheel is a factor which cannot be eliminated, and it therefore establishes the minimum limit in which the stoppage may be effected. But in a very large majority of cases in which a quick stop becomes necessary this interval would allow of ample time to prevent accident, provided there were no other source of delay. As, however, word must be conveyed to the engineer, either by messenger or signal, and he must then shut off steam by closing the throttle, much valuable time is lost, and the result may be serious. In some (though not numerous) instances

ing the past year some four or five cases have been recorded in which engines of large power have been wrecked from "running away" under sudden release of load. From the accounts of these accidents it appears that prompt closing of the throttle, even after the danger became apparent, would have prevented the disaster which ensued. But in an emergency of this kind the engineer takes his life in his hand in approaching the throttle to shut down, and it therefore requires an amount of nerve not always available, even in an ordinarily brave man.

The Standard Valve Company, 175 Dearborn street, Chicago, are now placing on the market an automatic safety throttle, illustrated by the accompanying cuts. As the name implies, it is automatic in its closing movement, and may be actuated either automatically or by hand, as desired. The opening movement, although also automatic, is controlled by the screw and hand wheel, as it would be manifestly improper to trust to a mere mechanical device, however perfect, the performance of a function requiring the exercise of care and judgment, as does the starting of an engine. As seen in Fig. 1, the valve proper is of the ordinary globe type. This sectional view shows very clearly the internal construction, and renders a detailed description un-

as there is no escape of steam from that end of the cylinder. The screw and hand wheel are run out far enough to be clear of the end of the valve stem. The valve disk is, of course, in perfect equilibrium, and therefore exerts no influence either way. Steam also passes by the small channel shown in the cylinder head to the outer head of the small piston, the stem of which engages the forked lever and tends to force it inward against the small conical escape valve. The inner end of this piston is not subjected to steam pressure, as it is in direct communication with the atmosphere through the exhaust passage. The long plunger passing through the valve stem is forced by the steam pressure on its inner end to the extreme outward position, its shoulder forming a valve to arrest any slight leakage of steam which may pass the packing. The forked lever is held at its upper end by the short arm of the bell crank lever, the long arm of which, in turn, engages the shoulder of the third lever, which is counterweighted and carries at its upper end the magnet armature. The proper distance of the latter from the magnet is adjusted by means of the small check screw shown. If now it is desired to stop the engine, the electro-magnet is excited (by pressing any one of the push buttons *a* in Fig. 2 in the circuit), which, by at-

tracting the armature, releases the trigger end of the bell crank lever from the engaging shoulder and allows the steam pressure on small piston to force the latter inward, thereby unseating the escape valve and permitting the exhaust of steam from the large area of the differential piston at a more rapid rate than that at which it can pass through the port in the piston. It is obvious that this reduction of pressure will allow the undiminished pressure on the inner or smaller area of the piston to force the latter and, therefore, the valve disk to the outer or closed position, and that its speed of movement will be proportioned to the reduction of pressure due to the difference between the passage of steam through the piston and its release through the escape valve. By means of the small adjusting screw provided for checking the upward movement of the long arm of the bell crank lever, the inward movement of the small piston, and consequently the amount of opening of the escape valve, may be readily controlled. So sensitive is the device to this adjustment that it can be varied from an almost imperceptible to an instantaneous speed of valve closure. The steam passing through the large piston will of course continue to escape through the exhaust passage until the escape valve is closed. This is effected by the engineer in following up the retracted valve stem with the screw and hand wheel—the screw head first striking the plunger drives it inward until it contacts with and closes the escape valve, at the same time forcing the small piston out-

cisely the same as with any of the ordinary types of throttles, as it will readily be seen that, although there is no connection between the screw and valve stem, the opening pressure on the piston will cause it to follow the receding screw until the valve is wide open. A push button located within convenient distance of the hand wheel enables the engineer, even in making regular stops, to close the valves by means of the current, and by promptly following up with the screw the levers are reset and the valve ready for the manipulations

intended for use only in case of serious emergency, are protected from being maliciously tampered with by a covering of glass which must be broken before the button can be reached to make the contact.

Thus far, the description has referred to the automatic action of the valve as controlled by hand—i. e., by pushing the button. The device shown in Fig. 3 is intended to make even this feature automatic, but obviously its use becomes necessary or even desirable only under certain circumstances. It is

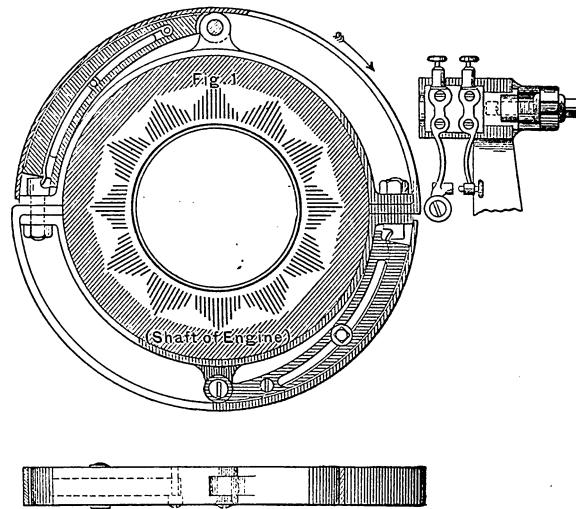


Fig. 3.—Speed Stop.

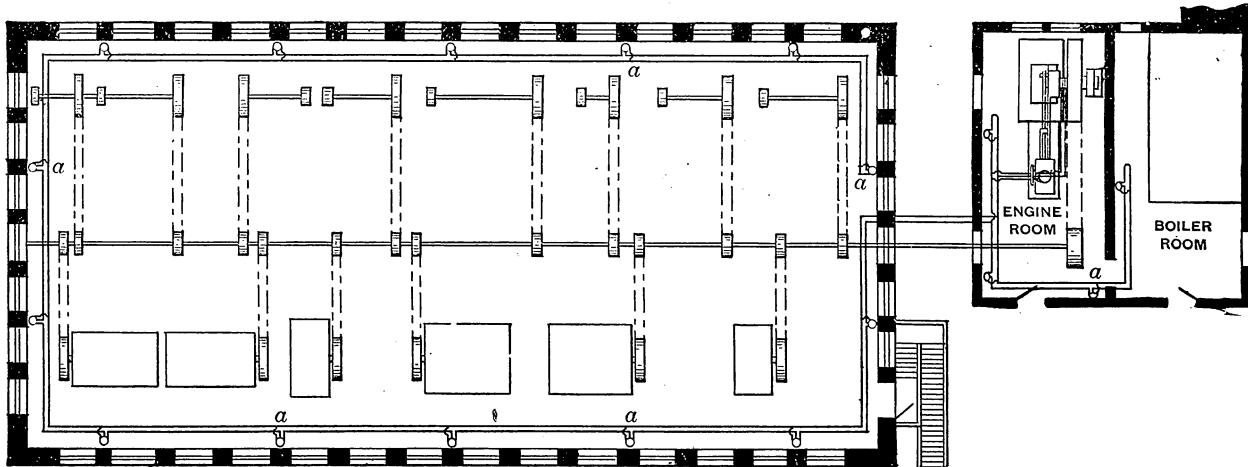


Fig. 2.—Plan View, Showing Method of Wiring Factory.

THE STANDARD AUTOMATIC SAFETY THROTTLE VALVE.

ward, which in turn transmits the motion to the three levers and returns them to the normal or set position, where, by reason of the counter weight on the armature lever the trigger engages the shoulder of the former, and so holds the several parts until they are again released by the electrical contact. This, of course, by stopping the exhaust, will enable the pressure to quickly equalize on the two sides of the differential piston, and the result would be the prompt reopening of the main valve, were it not for the fact that the screw head is by this time in contact with the end of the valve stem, and the valve is thus held firmly to its seat against the opening pressure on the piston. When it is desired to start the engine, the manipulation of the hand wheel by the engineer is pre-

necessary to bring the engine to a standstill in the desired position off the center.

In case of any emergency, in even the most remote part of the establishment, the pressing of the nearest push button will close the throttle as quickly as would the one located directly on the engine. By this means no time is lost in effecting a stoppage, and the engine will be at rest as soon as the momentum of the fly wheel is expended. Push buttons are located at different points in the engine and fire rooms, as shown in Fig. 2, so that in case of necessity the engineer or fireman can close the throttle without going near the engine. All of the buttons directly under control of the engineer are of the ordinary open form. Those throughout other parts of the establishment, being

termed the "speed stop," and its function is to protect the engine from danger through excessive acceleration of speed, caused by slipping or throwing off of main belt, breaking of governor belt, or any other of the various accidents which by suddenly decreasing the load or unduly increasing the point of cut off might cause the rotative speed to exceed the safe limit. The arrangement consists simply of a pair of flexible arms, shown at the right in the upper view, Fig. 3, carrying at their lower ends adjustable contact points, and at the top the binding posts for the electric wires. The arms are carried by a slide having a lateral adjustment, which is supported by any convenient form of stand necessary to attach it to the frame of the engine or some other convenient fixed point. The

contact is caused by means of a very simple form of centrifugal device, which is bolted directly on the main shaft of the engine, and thereby eliminates the very unreliable feature of transmission of motion from the engine to a detached part. The adjustment of the expanding periphery of the centrifugal is preferably made so as to permit it to make the contact points meet at an increase of about 25 per cent. over the regular speed of engine—this being well within the safe limit, although any desired variation may as readily be made. From the construction and location of the centrifugal, it would be impossible, under even the most extreme conditions of decreased load under full steam, for the engine to make more than one-half a revolution at increased speed, before the throttle would close automatically, and all danger be obviated. As the use of the button for making regular as well as emergency stops is much more convenient than closing the throttle by hand in the usual manner, the engineer will naturally adopt this method. Consequently, he is at all times informed as to the condition of his battery, and that his current is up to the necessary strength.

Our Tin Plate Production.

Ira Ayer, special agent of the Treasury Department, has submitted to Secretary Carlisle a report as to the production of tin and terne plates in the United States during the quarter ended June 30, with comparative statements of production.

During the quarter named 40 firms manufactured 46,466,385 pounds of tin and terne plates proper, against an output of 38,260,411 pounds by 36 firms during the previous quarter.

Of the output for the quarter 33,501,344 pounds, or more than 72 per cent., were made from sheets rolled in the United States, and of this amount 32,477,703 pounds, or about 97 per cent., consisted of the class of plates weighing lighter than 63 pounds per 100 square feet.

Of the commercial plates manufactured during the quarter 26,752,996 pounds were coated with tin and 19,713,339 pounds were terne coated.

The quantity of American sheet iron and steel made into articles and ware, tinned or terne plated, was 1,807,854 pounds. This makes the aggregate output of tin and terne plate for the quarter, from all sources, 48,274,189 pounds; that of the previous quarter was 40,428,300 pounds.

The production for the quarter subject to comparison with net imports, under the Department's ruling, inclusive of products from American sheet iron and steel tinned or terne plated was 34,285,557 pounds, as compared with 26,545,162 pounds during the previous quarter.

The production for the fiscal year ended June 30, 1894, subject to such comparison, stated by quarters, was as follows:

Quarter ended	Pounds.
September 30, 1893	9,257,610
December 31, 1893	16,553,718
March 31, 1894	28,545,162
June 30, 1894	34,285,557

Total for fiscal year ended June 30, 1894..... 88,642,045

By report dated February 20, 1893, it was shown that one-third of the net importations of the class of plates

weighing lighter than 63 pounds per 100 square feet during the fiscal year ended June 30, 1892, was 79,307,939. The difference is 9,334,106.

From these figures it is seen that during the fiscal year ended June 30, 1894, American manufacturers produced of tin and terne plates as defined in the law, solely from sheets rolled in the United States, 9,334,106 pounds in excess of the net imports during the fiscal year ended June 30, 1892, subject to comparison with such domestic production.

The production of black plates in the United States during the quarter was 37,864,901 pounds, and of this amount 32,449,205 pounds, or more than 85 per cent., belonged to the class weighing lighter than 63 pounds per 100 square feet. The production of the previous quarter was 30,070,701 pounds, of which 23,514,881 pounds, or more than 78 per cent., were of the lighter class.

The production of American black plates of the class weighing lighter than 63 pounds per 100 square feet was 8,934,324 in excess of that of any previous quarter.

Twenty rolling mills made sworn returns of production, against 18 that made sworn returns for the quarter preceding.

Of the 40 firms that made sworn returns of the manufacture of commercial tin and terne plates, 20 used wholly American plates, with an output of 25,558,798 pounds; 5 used wholly foreign plates, with an output of 4,700,197 pounds; 15 used both American and foreign plates, with an aggregate output of 16,207,340 pounds, of which 7,942,546 pounds were made from American black plates.

Sixteen stamping or other manufacturing companies that used American sheet iron and steel in the manufacture of articles and wares tinned or terne plated submitted sworn statements of production, as against 14 during the previous quarter.

The following table summarizes the production of tin plate since the industry was again started:

Production of Tin Plate.

Quarter ended	From American black plate, pounds.	From foreign black plate, pounds.	Total pounds.
Sept. 30, 1891..	785,547	41,375	826,922
Dec. 31, 1891..	1,200,661	209,160	1,409,821
Total, 1891.	1,986,208	250,535	2,236,743
March 31.....	2,132,082	1,077,143	3,209,225
June 30.....	5,178,263	3,022,488	8,200,751
September 30..	5,920,082	5,182,843	10,952,723
December 31..	8,043,449	11,713,042	19,756,491
Total, 1892.	21,273,876	20,845,316	42,119,192
March 31.....	11,371,968	18,194,431	29,566,399
June 30.....	18,264,225	21,279,362	39,543,587
September 30..	8,794,027	18,351,458	27,145,480
December 31..	15,907,669	11,443,572	27,351,241
Total, 1893.	54,837,889	69,268,818	123,606,707
March 31.....	27,765,182	10,495,249	38,260,411
June 30.....	33,501,344	12,964,991	46,466,335
Total, six months 1894....	61,266,508	23,460,240	84,726,746

The amount of American sheet iron and steel made into articles and wares tinned or terne plated by fiscal years is stated as follows:

	Pounds.
1892.....	5,620,867
1893.....	8,802,681
1894.....	6,268,263

The production of American black plate has grown vigorously. The fig-

ures for 1893 and for the first six months of 1894 are as follows:

Production of Black Plate.

	Lighter than 63 pounds per 100 square feet.	Heavier than 3 pounds per 100 square feet.	Total.
1st quarter.....	13,287,507	6,361,848	19,649,355
2d quarter.....	14,208,192	6,780,321	20,988,513
3d quarter.....	8,147,082	3,208,276	11,355,368
4th quarter.....	17,197,064	2,482,246	19,679,910

Total, 1893..... 52,640,455 18,832,691 71,673,146

	Lighter than 63 pounds per 100 square feet.	Heavier than 3 pounds per 100 square feet.	Total.
1st quarter.....	23,514,881	6,555,820	30,070,701
2d quarter.....	32,449,205	5,415,896	37,864,901

First half 1894..... 55,964,086 11,971,516 67,935,602

The quantity of tin plates and terne plates imported and entered for immediate consumption, and of such as were imported on and after July 1, 1891, and were withdrawn from warehouse for consumption during the quarter ended June 30, 1894, was:

	Pounds.
Tin plates.....	110,505,089
Terne plates.....	8,051,019

Total..... 119,556,088

The quantity of tin plate and terne plates on which duties had been paid and which were used in the manufacture of articles exported with benefit of drawback during the quarter was:

	Pounds.
Tin plates.....	36,501,595
Terne plates.....	54,856

Total..... 36,556,451

A separate table enumerates the returns as sworn to by manufacturers, without, of course, revealing their identity. One maker produced 4,674,310 pounds during the second quarter of this year exclusively from American black plate. Another made 4,350,574 pounds, of which 4,020,075 pounds were from foreign black plate. Four others made over 3,000,000 pounds, two over 2,000,000 pounds and five over 1,000,000 pounds during the recent quarter.

On the whole the exhibit is one very flattering to American producers. It is certain that the totals of the third quarter will be even more favorable.

Water Power at Buchanan, Mich.

The utilization of water power in generating electrical energy for manufacturing purposes is a feature of present industrial development. The city of Buchanan, Mich., is one of the latest points at which an enterprise of this character has been established. The Buchanan Power and Electric Company here own a dam across the St. Joseph River with a head of 3000 horse power at low water. They have equipped a power house with three 100 horse-power turbine wheels on the north side of the river, and are building a power house for wheels of 800 horse power on the south side. The small plant operates a dynamo for lighting the town and a generator for power used in operating the water works pumps, motors in small factories, elevators in warehouses, &c. The power house on the south side will be used mainly for running factories, and inducements are being offered to manufacturers at other points to locate in this vicinity. The water power at Buchanan is said to be one of the finest in the Central States.

A press dispatch states that one mill of the Niedringhaus Tin Plate Works was started up last Monday independently of the Amalgamated Association of Iron and Steel Workers and at a reduction of 25 per cent.

THE WEEK.

English trade journals state that a company is being formed in Scotland to work a property in Illinois, said to consist of a mountain of nickel ore. The ore has been analyzed by Scotch experts, and the reports thereon are regarded as very satisfactory.

An English syndicate is said to be arranging to purchase all the British Columbia salmon canneries. Four of the largest concerns passed into their hands last week.

An industrial exhibition is to be held next year at Teplitz, in Austria. A special section will be devoted to labor saving machinery and motors for small industries.

According to the statistics published by the Lyons Silk Exchange the total production of raw silk of the world in 1893 was 27,350,000 pounds, against 25,270,000 pounds in 1892. These figures do not include the quantities of raw silk consumed in China and Japan, which amount to a large volume, but which cannot be even roughly estimated.

A North German Industrial Exposition is to be held at Königsberg from May to August next year. Several of the sections will be thrown open to international exhibits.

Navigation on the St. Lawrence River was closed on November 22.

November's gales in the Atlantic have been of unusual strength and duration this year. Vessels crossing during the last two weeks have encountered very heavy weather, and all the mail steamers have suffered more or less delay.

The solarometer, a new nautical instrument invented by Lieut. W. H. Beehler of the United States Navy, and designed to enable vessels to navigate in thick weather, has been supplied for trial purposes to the United States cruiser "San Francisco," as well as to the Atlantic liners "Campania," "New York," "La Touraine," and "Lahn." The instrument has been already tried at sea with great success, and shipping men freely predict a future of great usefulness for the invention. The solarometer has been on view recently at the New York Maritime Exchange.

In his annual report, just presented, Postmaster-General Bissell exhibits a deficiency in the postal revenues for the fiscal year ended June 30, 1894, of \$9,243,935. The total revenue derived was \$75,080,479, and the expenditures \$84,824,414. For the current fiscal year Mr. Bissell estimates that the expenditures will amount to \$90,399,485, leaving an estimated deficiency of \$5,971,736, and his estimates for the fiscal year ending June 30, 1896, place expenditures at \$91,059,283 and the deficiency at only \$4,151,876.

The annual report of Herman Stump, United States Superintendent of Immigration, just issued, shows that during the fiscal year ended June 30, 1894, 298,020 immigrants arrived in this country, of whom 285,630 were landed and 2389 debarred from landing because of coming under the operation of the contract labor law. Of the immigrants landing 96,000 were *en route* to New York State, 42,000 to Pennsylvania, 25,000 to Massachusetts and 22,000 to Illinois, the others being scattered over all the other States.

Receiver for Moorhead-McCleane Company.

At Pittsburgh on Monday George S. Griscom, for some time president of the Moorhead McCleane Company, operating Soho Iron & Steel Works of Pittsburgh, was appointed receiver of that concern. The petition for the appointment was filed by the Bank of Pittsburgh, Pittsburgh Bank of Savings, the Exchange National Bank, the People's Savings Bank, M. K. Moorhead and George F. McCleane. Each of the banks mentioned is creditor in the following amounts: Bank of Pittsburgh, \$36,000; the Pittsburgh Bank for Savings, \$28,000; the People's Savings Bank, \$36,000; the Exchange National Bank, \$54,000. All the indebtedness is represented by negotiable promissory notes of the defendant company. The plaintiffs' bill sets forth that the defendant company have a capital stock of \$1,600,000, divided into 16,000 shares. Of these M. K. Moorhead owns 6625 shares and George F. McCleane 4583 shares.

The plant owned by the company consists of a blast furnace, five sheet mills, two plate mills, two open hearth steel furnaces, a galvanizing plant and 60 coke ovens, covering about 140 acres. The corporation is indebted in the sum of \$800,000, over \$500,000 of which is represented by the negotiable notes which are outstanding and in the hands of corporations, partnerships and other persons. The holders of these notes have threatened to begin legal proceedings to obtain judgments and seize the property of the defendant company. Owing to financial stringency the company have been unable to pay their debts and are now unable to continue operations. It is believed that if the plant can be put under the control of some one capable of keeping it in proper condition the company will be able to realize sufficient to pay its debts. The real estate and fixtures of the company are subject to several mortgages, in part of which the plaintiffs are interested, and it is not intended to affect the validity of them by the present proceedings. The plaintiffs asked for the appointment of a receiver and a decree authorizing him to sell as much of the property as will be necessary to pay the debts of the company. The answer of the defendant company admits that the best interests of all the creditors and stockholders will be subserved by the appointment. This admission is made in pursuance of a resolution by the board of directors of the company. The defendants say: "We do believe that with better times and a better market for our manufactured product we will be able to run our works and pay our debts."

Erskine Rumsey has been appointed general mining engineer of the Alabama division of the Tennessee Coal, Iron & Railroad Company.

No. 1 Furnace of the Thomas Iron Company, at Hokendauqua, recently rebuilt, last week produced 990 tons of pig iron. This is the largest output for any single stack in the Lehigh Valley making foundry iron.

The Beaver Falls Mills of the Carnegie Steel Company, Limited, at Beaver Falls, Pa., had a narrow escape from total destruction by fire on Friday night of last week. A local newspaper gives an account, from which we take the following: The fire started in the cleaning department of the nail mill, and communicated to the tool house

and the machine shop, which were destroyed. The firemen were badly handicapped by low water pressure, and at one time it seemed certain that the warehouse, containing about 55,000 kegs of nails, would be destroyed. A wing of the department known as the "Brooklyn" room, in which about 45 of the 140 nail machines in that room were located, then caught fire. In this department two small engines were destroyed, but a larger one was saved. The buildings burned were one-story structures. The rod and wire mill was not damaged, and continues in operation.

Bids for Machinery for the Washington Navy Yard.

The Navy Department recently received bids for the following machines for the Washington Navy Yard:

Two 30-inch slotting machines designed for very heavy work; The Niles Tool Works, \$8790; Bement, Miles & Co., \$7920.

Four horizontal boring and drilling machines to bore to the center of a 69-inch circle, The Niles Tool Works, \$11,600; George Place, \$11,160; Bement, Miles & Co., \$10,960.

One 40 horse-power engine to supply power for blowers in forge shop: Manhattan Supply Company, \$895; the Forsaith Machine Tool Company, \$755; the Niles Tool Works, \$650; the Elliott Machine Company, \$598.99; Armington & Sims Engine Company, \$675.

One electric traveling crane having a lifting capacity of 25 tons, and one electric traveling crane having a lifting capacity of 10 tons: Yale & Towne Mfg. Company, \$11,584 (modified design); Morgan Engineering Company, \$9572; Manning, Maxwell & Moore, \$10,985; the Industrial Works, \$20,300.

One 12-foot, one 10-foot and one 8-foot vertical boring and turning mill, the Niles Tool Works, \$11,485; Bement, Miles & Co., \$11,450; the Pond Machine Tool Company, \$10,310.

Two planing machines to plane 18 feet long, 8 feet wide and 8 feet high, and two machines to plane 14 feet long, 4 feet high and 4 feet wide, Bement, Miles & Co., \$17,000. (This was readvertised.)

Two portable drills, capable of drilling holes up to 3 inches in diameter over a surface of 56 inches diameter at one setting, the Forsaith Machine Tool Company, \$575; Manning, Maxwell & Moore, \$577; Frank Clouds, \$576.18.

Two horizontal boring, drilling and milling machines to bore to the center of a circle 140 inches in diameter; the Niles Tool Works, \$14,900; Bement, Miles & Co., \$13,920.

One universal radial drill, distance from center of column to end of arm to be not less than 108 inches; the Niles Tool Works, \$2495; Bement, Miles & Co., \$2450.

Two 24-inch shaping machines; W. H. Warren Machine Tool Works, \$4900; the Niles Tool Works, \$3280; Bement, Miles & Co., \$3400.

Two portable drills, capable of drilling up to 2 inches in diameter over a surface of 43 inches diameter at one setting, the Forsaith Machine Tool Company, \$459; Manning, Maxwell & Moore, \$457; Frank Clouds, \$453.

Ten differential pulley hoists, capacity 2 tons, to hoist 9 feet, Yale & Towne Mfg. Company, \$178.50; Forsaith Machine Tool Company, \$155; Manning, Maxwell & Moore, \$174.50; George Place, \$412; The Elliott Machine Company, \$380; Frank Clouds, \$195; Maris & Beekley, \$270.

The Iron Age

New York, Thursday, November 29, 1894.

DAVID WILLIAMS, - - PUBLISHER AND PROPRIETOR.
CHAS. KIRCHHOFF, - - EDITOR.
GEO. W. COPE, - - ASSOCIATE EDITOR, CHICAGO.
RICHARD R. WILLIAMS, - HARDWARE EDITOR.
JOHN S. KING, - - BUSINESS MANAGER.

The Lake Superior Ore Trade.

The production of Lake Superior iron ore in 1894 has considerably exceeded expectations at the beginning of the year. It will be in the neighborhood of 7,300,000 gross tons, including rail shipments to local consumers. This is by no means a bad showing as compared with previous years. The annual shipments for five years were as follows: 1889—7,292,754 tons; 1890—9,012,379 tons; 1891—7,062,233 tons; 1892—9,069,556 tons; 1893—6,060,492 tons. It will be seen from these figures that 1894 surpasses 1889 and 1891 and only falls short of the heavy years, 1890 and 1892, by 1,500,000 tons. It runs far ahead of 1893. The large shipments of the past season followed a winter of comparative inactivity at the mines in the accumulation of stock piles and general preparation for the shipping season. Mining companies suffered severely from the financial stringency and general lack of confidence among capitalists and financiers, and even those who were willing to keep their miners at work found much difficulty in making the necessary provisions for funds to pay wages. And yet, notwithstanding the unpropitious conditions which thus obtained during a period which is ordinarily devoted to systematic preparations for the short shipping season, the output has been large. It shows what may be expected from our main iron ore district when the iron trade again becomes active. The figures of the great years, 1890 and 1892, can easily be surpassed. Credit for this is, of course, largely due to the opening up of the great Mesabi range, which began in 1892, attracted considerable attention in 1893 and became a great factor in the ore market in 1894.

A peculiar feature of the shipments of the season just ending is the remarkable increase over any previous year in the output of Bessemer ore, the increase amounting to over 1,000,000 tons. If the Mesabi range had not been opened at this time there would seem to be good reason for believing that the heavy demand for Bessemer ore thus shown would have been in excess of the supply available from the other ranges, taking into account the general stoppage of mining last winter. And yet this inference may not be entirely warranted, as the cheapening of Bessemer ore by the Mesabi flood and the consequent reduction in the cost of steel products must have had an important effect in widening the con-

sumption of soft steel by enabling it to penetrate additional markets and conquer additional lines. But non-Bessemer ores hardly held their own with previous years of depression, as was shown by the number of such mines that have been in a condition of suspended animation during the entire season, some of them for the first time in their history. So little iron was puddled in comparison with former years that almost the only demand for non-Bessemer ores came from the makers of foundry pig iron.

A record has been established in the price of Lake ores which promises to be a standard for future seasons. In spite of the protests of mine owners, fee holders and companies mining under leases that ore properties would not be exhausted at very low prices for ore, but that they would be allowed to stand unworked until times improved, a sufficient number of mining companies have kept at work to effect a complete revolution in the Lake iron ore trade. The price of Bessemer ores at lower lake ports in 1893 was \$4 to \$4.50 and of non-Bessemer ores from \$3 to 4. These rates were at the time regarded as extremely low, and were said to leave the mining companies very little profit after paying royalties, miners' wages, rail rates to shipping ports and vessel rates to receiving ports. In comparison with the rates of 1894, however, they were high and remunerative. Bessemer ores of high grade have sold under \$2.50 at receiving ports and non-Bessemer ores of high percentages in metallic iron have sold down to \$2 if not lower. The average for the season is placed by well informed members of the trade at \$2.50 to \$2.75 for Bessemer and \$2 to \$2.25 for non-Bessemer.

Royalties have been reduced, miners' wages have been cut, railroads have lowered their charges from mines to docks and vessel rates have gone to a point which would have been ruinous to the old fashioned small freighters. The revolution which has been thus effected in the ore trade promises to be permanent, or at least to exist until some great upheaval in general business sends all values skyward. The acceptance of existing conditions is shown by the preparations which are now being made for the operation of mines during the coming winter on all the ranges. The Marquette range may show less activity than the others on account of deeper workings and higher cost of bringing ore to surface, but even in that locality the large companies are laying in supplies for the winter's run. On the Menominee range work will be continued in all the mines that are able to compete under last season's conditions. On the other ranges the winter promises to be one of great activity, but especially on the Mesabi. It looks now as if the Lake Superior region will be prepared next spring to furnish a much greater quantity of ore at low prices than in any of the greatest years in the history of that trade.

Should Manufacturers Admit Visitors?

It is a fact well worthy of attention that the treatment accorded visitors to manufacturing establishments by the proprietors is not the same now that it was a few years since. It is not so long ago that we heard much about shop secrets, mysterious and dark apartments where the product was incubated, and were told of special machines of wonderful design which could not be viewed by the vulgar eye because they were the vital part of the business. An atmosphere of mistrust pervaded everything, and the manager of a works closely watched a visitor to make certain that he did not carry away with him the foundation and roof of the building and all things intervening. Once in a long while a place was found where the visitor was welcome, where he was shown the special appliances, and where the methods making the business successful were explained to him in detail. These two classes or divisions differed widely in the character of their output, no matter what it was. The mysterious man might or might not have devices of exceptional value, but the quality of his product seemed to bear a certain fixed relation to the degree of mystery—the greater the mystery the poorer the product. On the other hand, the man whose establishment was open to inspection almost invariably produced goods of the highest quality in design, material and workmanship. It seemed that he courted a scrutiny of his methods and did not dread a critical examination of his products.

This has now been changed to such an extent that the vast majority of manufacturing concerns are pleased at the advent of a visitor. This change has been aided largely by the technical periodicals and the many technical societies. We understand perfectly that business methods are not the same, and also that while there is the same sharp rivalry there is not the old feeling of distrust of one's neighbors. We also appreciate the fact that the army of bright engineers has grown with the times, and that therefore it is not so easy now as formerly to control the manufacture of any article by means of special appliances. The improvement of these special tools would soon take place. But these influences, working unaided, would not have produced the liberal spirit now manifested by the manufacturer in the conduct of his business. The technical press have, whenever there were meritorious features apparent, presented descriptions of methods and appliances for the benefit of their readers. The shop owner has found that when he permits the publication of a certain device for doing a certain work—perhaps some particular work in his own place—he derives a benefit from the prominence he receives as a designer of ability. The same result is reached when he describes his shop and busi-

ness methods, and explains in detail just how he conducts his establishment. If his system is perfect, the reader knows that his product can be relied upon in every respect. When, as now, many do this, there is an interchange of opinion and experience of the greatest value to all concerned. The man who casts his idea as bread upon the water invariably finds that it returns to him increased many fold. The spirit of sociability engendered by the technical societies, the free and open discussions and the custom of explaining minutely valuable methods and apparatus, have done much toward doing away with the exclusiveness heretofore so common.

Manufacturers as a whole will be still more benefited when they adopt the custom of more generally and frequently visiting works in the line they are most interested in. This mutual inspection will come eventually and will result in improvement in methods and appliances. Even now the leading concerns, particularly the most prominent builders of machine tools, cordially receive the visitor, no matter whether he is a direct competitor or not. This being the case in one industry it is not too much to believe that before long the door of a factory will be made without a bar.

A Peaceful Strike Succeeds.

A peculiarly conducted strike has just been settled in a Western city. It appears that the managers of a large foundry attempted to compel their molders to remain in the works until the regular quitting time on days when they had taken off a heat, the men having been accustomed to leave after that work was done. When the issue was made the men struck. New men were hired to take their places. And here comes the peculiarity of the strike. No attempt at violence was made. Not a man was hurt. Lately, rioting and bloodshed have become such constant accompaniments of a strike that this is very peculiar. Nevertheless, obstructive tactics were employed. The men were not disposed to stand by quietly and see their places filled by others. They managed, in some way, to be able to interview every new hand and convince him that it was wrong for him to take another's place. Perhaps some forcible talk may have passed on such occasions, but if so, it does not appear on the record. At all events, the company finally became very tired of breaking in successive gangs of new men, and the strike ended after a short conference between a committee of the men and some representatives of the company, which was conducted in the most friendly manner, clearing up all misunderstandings. The company had been vanquished, and they gracefully surrendered. In the language of a local paper, during the entire strike "the men were acting like gentlemen," and their splendid conduct was an important factor in obtaining a favorable settlement. This is one of the very few strikes this year in which the strikers gained their point, and it is very significant that they accomplished it without resorting to violence.

CORRESPONDENCE.

The Rate of Progress of Iron Manufacture.

To the Editor: There is much discussion as to the future development of the iron and allied industries. That our increase in production is out of proportion to our increase in population seems evident in spite of the fact that consumption *per capita* may have increased. It is said that our future rate of progress ought to be slower. Is this natural, healthy or likely? Has there been much Texas cotton grower talk among iron manufacturers of restricting production during this depression? One of the largest steel works has led the way in the policy of heavy tonnage, and its example has been very generally followed. Whether they have gone to extremes or not, the heavy fixed charges of the model plants of to day have more firmly fixed the principle of maximum production in the minds of American manufacturers in all lines than ever before. Say we are manufacturing to-day at about one-third of our capacity. (This is a rough guess, but may do for example). In six months we may increase production 50 per cent.; in a year more we may have another increase, due to the new uses of metals, and larger use, due to continued low prices, like the notable case of beams. We would still be far below our maximum production, and there is but one way to get to that point, and that is by seeking possession of the markets of the world, which is a withheld birthright of the American nation. Let wages go down another 10 per cent., or even let there be a certainty to the manufacturer of wages staying at their present point for a year or so, and there is a good prospect of a heavy exportation of American manufactures being the result.

It goes without saying that the writer believes the workingman's wages would be of more value than ever before with such a new order of things, the workingman's opinion to the contrary nevertheless.

J. S.
RICHMOND, VA., November 22.

The Validity of a Sunday Note.

To the Editor: The law says "A note made on Sunday is void." "A" wishes to get a note discounted on Sunday. "B" consents to discount it and gives "A" a check dated the following day, less 10 per cent., which exceeds by 4 per cent. the legal interest of the State wherein the transaction occurs. Now, "A" indorses the note, "B" makes and signs the check; one is exchanged for the other, both delivered to each "A" and "B"; the deal is completed and concluded to this point on Sunday. "A" gets check cashed on a secular day. Now, can "B" hold "A" upon his indorsement on note and can he sue and recover upon the check?

Yours truly,

BENSON.

Upon the solution of two questions depends the answer to this inquiry: First, does the transaction violate the Sunday law? and second, does it violate the usury law? If it violates either law the note is void and "B" cannot sue "A" on the note. And if the note is void either because of the Sunday or the usury law then the check will be equally open to the same objection and will be of no effect to create a legal obligation. Of course, considered merely as an order on a bank for the payment of money

to the payee of the check, the check is valid and legal. But as a bill of exchange its indorser is not liable, assuming that the principle is correct that "a note made on Sunday is void." The indorsement of the note is equally as fatal as would be the signature by the maker if done on Sunday.

But the law differs greatly in the different States as to the acts prohibited as unlawful on Sunday. In New York the statute reads: "All labor on Sunday is prohibited except the works of necessity or charity." "All trades, manufactures, agricultural or mechanical employments upon the first day of the week are prohibited," and "all manner of *public* selling or offering for sale of any property is prohibited."—Penal Code, sections 263, 266 and 267. It will be noticed that only *public* selling is forbidden. Therefore, private selling is not unlawful. A contract made on Sunday for the sale of a horse, or of a house, between two parties and made privately is not unlawful, but can be enforced; but if the sale were made by an auctioneer it would be void. Just what degree of publicity in the circumstances surrounding the sale would make it illegal and void would be a nice question of fact in many cases.

It will be noticed also that the statute does not prohibit the making of a contract on Sunday. It is labor and public selling which are alone forbidden. Therefore, a note made, indorsed, transferred and discounted on Sunday in New York is *not* void in that State for that reason.

Eberle vs. Mehrbach, 55 New York Court of Appeals Reports, page 682. In this case the court not only holds as above, but suggests that it would not allow a party to a contract made on Sunday to take advantage of his own wrong-doing, and aid him to make it void for his own benefit. This is supposing the case of a contract which would be illegal under the statute.

But in most of the States the language of the statute law as to Sunday is different, and a note made, delivered and discounted on Sunday would be void. The mere making of a note on Sunday does not make it void in any State, but the delivery and transfer of it on that day are necessary to make it void.

Second.—Does the transaction violate the usury law? In New York State it does violate the usury law, and the note would be void in that State on that ground. The taking of more than 6 per cent. for the use of money is usury, whether it be given as a bonus or in any other way. The borrower is not allowed to sue or recover any part of the sum lent. He loses the entire amount, principal and interest. This penalty is very severe and New York and Virginia are, we think, the only States where usury is punished by forfeiture of the whole sum. In other States usury is punished by forfeiture of the interest only; in still other States by forfeiture of the difference between the legal rate and the usurious rate. Some States, like Colorado, have no usury law at all. The answer to the inquiry then, so far as it is affected by the rate of interest received by B, would be that the note would be void only to the extent to which a usurious transaction is made illegal by the laws of the State where the note was made.

The proposal to form a cotton trust to bolster up the price of the staple does not meet with the approval of the large Southern cotton planters. The

only remedy for low prices, in their opinion, is a sharp reduction in the acreage planted for next year.

OBITUARY.

JOSEPH LEWIS.

Joseph Lewis, who died on November 19, in Kansas City, Mo., at the home of his nephew, Charles Cookson, of the Cookson Iron Works, was an inventor of some note. He was a member of the firm of Lewis & Sons of Manchester, England, at whose works was built, in 1829, George Stephenson's famous prize-winning locomotive. The machinery for Ericsson's "Monitor" was also made there. Mr. Lewis came to America in 1868, and settled at Chicago. He invented, among other things, a new principle of valve motion for locomotive and other engines, which is now in general use.

CHRISTIAN S. KAUFFMAN.

Christian S. Kauffman, general manager of the Columbia Iron Company, of Columbia, Lancaster County, Pa., and one of the best known iron manufacturers in the State, died at Columbia on November 20, aged 68 years. He was a Democratic State Senator from 1879 to 1882.

JESSE R. CRAWFORD.

Major Jesse R. Crawford, ex-superintendent of the Old Portage Railroad, and also ex-register and recorder of Mifflin County, Pa., was found dead in bed at his home in Gaysport, Blair County, Pa., on November 14. He was one of the pioneer iron manufacturers of Blair County. The deceased was 84 years of age.

JAMES COCHRAN.

James Cochran, a prominent coke manufacturer and one of the wealthiest men in Fayette County, died on the evening of November 25, at his residence in Dawson, Pa., aged 72 years. Mr. Cochran was given the distinction of being the pioneer coke manufacturer in the Connellsville region. He was the senior member of the firm of Brown & Cochran, coke manufacturers, and also a principal stockholder in the Juniata Coke Company and the Washington Coal & Coke Company. He was the owner of large coal tracts in Virginia, and was actively identified with the development of the Connellsville coke region. He was one of the organizers of the First National Bank of Dawson, Pa., and was its president for many years. His death was due to a dropsical affection which had confined him to his home for the past month. He is survived by a wife, five sons and two daughters.

GEORGE F. MEYER.

George F. Meyer died at his home, 170 West 123d street, New York City, on November 25, of diphtheria. Mr. Meyer was an engineer of very marked ability. He was born in this city in 1842. He was graduated as a mechanical and civil engineer from the University of Geneva and Berlin. He returned to this country 26 years ago and was then employed by Ericsson for several years, assisting him in designing many of his important inventions. He afterward entered the service of the Delamater Iron Works. He left that company 11 years ago to become consulting engineer for the De La Vergne Refrigerating Machine Company, at Port Morris, which position he occupied until his death.

Mr. Carnegie on the Situation.

Andrew Carnegie talked recently to Pittsburgh reporters on personal and local matters, and referred also to the general business situation. That part of his remarks which we quote has a wide interest:

"This is not, in my opinion, the time when any valuable forecast can be made. It is reported we are to have a sensational Presidential message looking to a change in our currency system. No matter whether the scheme would be better than that which we have, still the waters would be troubled and business must suffer. You know that if you wish to rebuild your house and live in it, no matter how much you are going to improve it—and all changes are not improvements by any means—you cannot enjoy undisturbed repose, neither can a nation.

"This is one objection to tinkering at short intervals with any policy, tariff or currency. It is bad enough with the tariff, but it is highly dangerous when the money and currency of a nation are tampered with. These are the blood of the whole system, industrial, agricultural, commercial, financial. The richest man down to the bootblack on the corner is vitally affected by a change in money. I did my best to impress upon the powers that be after the July panic of 1893 that the nation as a patient was not in position to undergo a surgical operation, and I had hopes that President Cleveland's usual good sense would lead him to postpone his tariff changes until the general health of the patient was good, at least. This advice was not followed.

"The patient had a great shock, the greatest shock that the United States has ever had, the Civil War excepted, and it is in my opinion a mistake to look for speedy recovery. No matter what improvements can be made in our financial system this is no time for change. I do not believe any decided improvement can be made in the system; it has worked splendidly and one feature, which is to agitators an objection, is really one of its decided advantages—it tends to keep wild speculation within bounds, as it does not expand to suit speculative balloonish gentlemen who cannot get money for the asking, only because they have nothing upon which prudent bankers wish to take the risk of lending.

"President Cleveland has been as sound upon money as President Harrison was and I can scarcely believe that he meditates a message that must temporarily derange the business of the country, and this any new policy must do. General Grant's words are to day full of wisdom: 'Let us have peace.'

"The action of Congress is also an important factor. If the country is to be excited by threatened changes in the tariff, no matter if these changes would be ultimately beneficial, which, of course, I do not believe they would be, still they would disturb the confidence not only of the people at home, but of the capitalists abroad, both of which are essential elements to the return of prosperity. Therefore, you see, gentlemen, we must wait until the turn of the year before any reasonable opinion can be formed."

D. W. Sisson of New York and others have applied at Boston for incorporation as the Plymouth Ship Canal Company, with authority to construct and operate a ship canal from Buzzard's Bay to Barnstable Bay. Another canal company, represented by Francis W.

Breed and others, have applied to be chartered as the Cape Cod Canal Company.

Washington News.

(From our Special Correspondent.)

WASHINGTON, D. C., November 27, 1894.

The reassembling of Congress on next Monday revives immediate interest in tariff reform legislation, which consumed so much of the attention of the last session of Congress, and which, according to the popular verdict, received such an overwhelming set back.

It is noticeable in the conversations of the arriving members who were parties to the passage of the Wilson bill and concurrence in the Senate modification, that they do not accept the expression of public sentiment on November 6 as that of opposition to their schemes of reform, but to something else—just exactly what they rarely undertake to tell. When the almost complete extinction of the personnel of the majority of the Committee on Ways and Means, including the chairman, and re-election of the minority representation are referred to, they show a disposition to change the subject.

If the tariff reformers carry out their present intimation of a determination to go right on and make an attempt to force some of the tentative measures in order to remedy what they term the defects of the Senate modification it may be put down simply as a theatrical move in order to retire gracefully from the contention.

The industries of the land need feel no anxiety of any serious outcome of such attempts if really undertaken. The minority will not reopen the subject in order to make an effort to restore matters, even the tin plate provisions of the act of 1890, as such an attempt could not succeed in the present control of the legislative and executive branches of the Government.

There will undoubtedly be some spirited parliamentary passages between the leaders, but they will amount to nothing but the enlivening of the monotonous deliberations upon questions of appropriation.

The President's message was considered to-day for the first time by the Cabinet. He has been at work upon it with great care and industry for several weeks, and, in conversation with his few closest friends, has expressed a determination to make this a very comprehensive State paper. He will not completely ignore tariff reform, but, by way of some elaboration of views, will expect to take off some of the sharp edges of the recent experiences.

As far as financial agitation affects the metallurgical or other industries, it can be said that the expanded observations of the message on the subject will go no further than their reading in the Senate and House. The proximity of the constitutional limit of the Congress and the importance of disposing of the appropriation bills will preclude any persistent action.

The reduced financial status of the Treasury and the experience of the majority at the polls is likely to serve as a drawback to liberal appropriations for naval construction by the coming session, although Secretary Herbert has recommended at least two new battle ships—one for the Atlantic and the other for the Pacific coast. He did the same thing last year, but the President de-

sired to curtail all expenditures possible on account of the falling off of revenues, and therefore did not take the subject up in a favorable spirit. If the Secretary does not fare better this time it is certain that the attempt will be made to add this as an amendment in the Senate. A liberal policy on this line, it is admitted, would help to stimulate the steel and iron markets and with it the industrial activity of the country generally.

The voluminous armor investigation and report on the alleged irregularities by the Carnegie Steel Company has come from the printer at last and makes upward of 900 pages. It contains a great deal of information, practical and expert, on the subject of armor manufacture and in that way will be a useful contribution to the literature of the subject. The immediate retirement of the chairman of the sub-committee, Mr. Cummings, he having been defeated for the Fifty-fourth Congress, and his almost simultaneous appointment to a municipal office is expected to wind up any further pursuance of this inquiry.

The proceedings of the gathering of the naval architects since the return of Commodore Melville and other department naval experts who were present have removed the discussion to Washington. These gentlemen agree that the second meeting was a great success and that these annual gatherings have come to stay. The utilization of the principle of the triple screw, which was disputed on the grounds of an economical application of power, is being discussed over again here.

Commodore Melville is not disturbed by the agitation, as he says "the ships did not only all but more than they were required to do and at no more relative cost than would be required by any other fast ships, and we say at less."

"The talk about the fast liners serving for cruisers is all very well as an adjunct to naval operations, but we must easily see how much less effective even with all their speed such vessels must be with their construction and arrangements.

"It seems as if good judgment would at once suggest the superiority and absolute necessity of the construction of fleet ships on warlike principles. Fast ships built for commercial uses every one might know would require very extensive rearrangement to adapt them to the severe uses of cruisers and for the effective use of batteries. It must not be overlooked that commerce destroying is not simply fun. That seems to be current in some minds. It is involved often in the most dangerous service, and in order to escape a pursuing fleet a little fighting might be necessary.

"As for the triple screw, I have not changed my opinion. The 'Columbia' has had a long voyage, and we may learn something of her work from the standpoint of economy. I think one of the most significant facts connected with our success with the 'Columbia' and 'Minneapolis' is the dominant fact that English experts, as far as I have learned, have been keeping very quiet. As a rule they have been very ready to criticise our work. I like it and I have been wishing they would begin on our application of the triple screw. Perhaps we might be interested. We know that they tried it in a small way and so did other nations, and did not make much out of it, but we have demonstrated its practicability for large ships in the matter of speed. I mean the

greatest speed ever attained. As we have entered, we might say, an unexplored field we must wait for further results on experience. Actual service will soon demonstrate whether what the bureau claims on the score of economy is well founded. Perhaps before too much is said on the other side it might be sagacious to wait for some facts. Merchant liners can never supplant professionally built cruisers for naval work in war any more than a militia army can do the work of regulars, especially by prompt and immediate service. They can only constitute an auxiliary force. But this is more so with a naval than with a land force. It takes more time to build and equip ships than to supply and equip a force of men. Of course battle ships are a necessity for heavy work, but cruisers are as indispensable for the light service on the water as cavalry is on the land."

The Commodore's views as an expert in the mechanical phases of the question show that theorists had better subside for their own sakes. It is a more difficult matter to build a ship than to sail her, especially such triple screw ships as the "Columbia" and "Minneapolis."

The Blackwell's Island Bridge.

In the market reports of *The Iron Age* reference was made last week to the fact that bids have been put in for the steel work for the Blackwell's Island bridge. The contract will be for the largest quantity of bridge material yet placed in this country. As we stated, it will take a few weeks before the bids received can be investigated and before the work is given out. The structure is to be built for the Long Island Railroad Company. The first coffer dam was sunk at Blackwell's Island a month ago, on the west side of the island, and is now ready for pumping operations and the building of the first pier. The second coffer dam, on the east side of Blackwell's Island, has been started. The other two coffer dams, which are to be used on the Long Island end and the New York end of the bridge, will be ready in about a month.

The whole bridge is to be constructed on the cantilever principle, with three spans—one span from Long Island to Blackwell's, one across the latter island and a third from Blackwell's to the New York shore. The piers will be built of massive blocks of red granite. The contract for building them has already been awarded. The main piers, on Blackwell's Island and each shore, will contain altogether 810,000 cubic feet of stone; the two anchor piers, 216,000 cubic feet. The total weight of all six will be 86,210 tons. There will be a span over each channel 846 feet long, and a continuous girder over Blackwell's Island, 613 feet long. A four-track road will occupy the center of the bridge, with carriage ways and sidewalks on each side.

The total weight of steel in the bridge will be over 53,000,000 pounds. The weight of steel in the viaduct approaches at the New York and Long Island ends will amount to 25,000,000 pounds. The distance required by law between the two spans and high water has been reduced by an act of Congress from 150 feet to 135, as in the case of the Brooklyn Bridge. The total height from high water to the top of the cantilever will be 255 feet.

The new bridge will be the heaviest long-span bridge in the United States; and the weight it is calculated to carry

makes it the heaviest bridge structure per foot in the world, not excepting the famous Forth bridge near Edinburgh. It is to be what is called "pin-connected," and to give some idea of the magnitude of the structure from details it may be mentioned that each "pin" will be 18 inches in diameter and weigh 3½ tons.

Charles M. Jacobs, consulting engineer of the Long Island Railroad, who put the gas tunnel under the East River and Blackwell's Island, says:

I have been engaged on this work for Austin Corbin and those interested with him in the Long Island Railroad for some time. For the last 12 months I have been working out the details. The company are now able to call for bids from the largest bridge builders, and propositions from all of them are now in our hands. The terminal station in New York will cover an entire block between Second and Third avenues. There are to be 12 tracks, 25 feet above the elevated roads, and connecting with both the Second avenue and Third avenue lines. Underneath will be a large market building, with elevated galleries, 75 feet wide. A sub-basement will provide a place for cold storage for produce brought in by the railroads and left over unsold. The exact location for the station has not been decided on, but as, under an act of Congress and the State laws, we have power to condemn all lands we may require, we see no difficulty in our way. Finally, men, money and brains have been secured for the enterprise, and the summer season of 1897 will see communication between Long Island and New York by one of the finest pieces of engineering in a bridge structure and terminals in the world.

A New Small Arm.

A pistol of a novel type, the invention of Hugo Burchard, an American, resident in Berlin, has been presented for trial before the Naval Small Arms Board at Newport, R. I., being exhibited for the first time last week. The special feature of the new weapon is that smokeless powder can be used with it. This powder is quite unserviceable with the types of small arms at present in use, and for this reason it is claimed that the Burchard weapon is likely to revolutionize this kind of equipment in the naval and military services of the world. It is described as being after the pattern of the Maxim mitrailleuse, automatic in action and receiving its ability to load and extract empty shells from the recoil. It is claimed to be the only small weapon capable of doing this continually. In the exhibition 100 rounds were fired without a hitch. The exhibitor, who was not an expert with the piece, fired 24 shots in 43½ seconds at a range of 110 feet, and all were hits. It weighs 2 pounds 12½ ounces, and is 11 inches in length. The grip is placed at the center of gravity, giving a steadier fire. Through it runs a magazine capable of holding eight cartridges, with nickel jacketed bullets of 7.65 mm., about the same caliber as the navy revolver of the present day. It has great penetration and effective range of about 500 m. A light adjustable stock may be affixed, making for all practicable purposes a carbine for cavalry. The cartridges are of the new Luger rimless type, which attracted so much interest recently during the small arms tests at Newport.

The Tin Plate Situation.

The conflict between the Tinned Plate Manufacturers' Association of the United States and the Amalgamated Association inaugurated by the starting up of the plants of Wallace, Banfield & Co., Limited, at Irondale, Ohio, and the United States Iron & Tin Plate Mfg. Company, at Demmler, Pa., is now on its second week and bids fair to be prolonged for some little time yet. Both concerns mentioned above are making good progress in their efforts to operate with non-union men, and while considerable time may elapse before sufficient competent workmen have been secured to operate all departments to full capacity, there can be but one outcome of the contest and that is the defeat of the Amalgamated Association. At the plant of Wallace, Banfield & Co., Limited, the bar mill was started up on Monday the 12th inst. with nearly a full crew and after being operated four or five days in order to get a stock of sheet bars ahead it was closed down and two black sheet mills were started up, the plant containing four. On Wednesday of last week a sufficient stock of sheets had been made to warrant starting up the dipping department and this was done on the day following. While it is not claimed that the output has been as large as it would have been with the old workmen, and that no imperfect sheets were turned out, it is claimed by the firm that so far they have had very little trouble and the product in quality has been as good as was ever made in the plant. The manager of this plant is an experienced roller and so is the superintendent, and when the plant was started the manager had charge of the day crew and worked right with them while the superintendent did the same with the night crew, and under this arrangement good results have been obtained. A high fence has been built around the plant by the firm to protect the employees, and the men are being lodged and fed in an unused building. This will be continued until all danger of violence from the old workmen has been removed. At the plant of the United States Iron & Tin Plate Mfg. Company, the attempt of the firm to operate with non-union men has been much more successful than the firm anticipated, both in the direction of securing competent workmen and in quantity and quality of the output. This firm are also feeding and lodging their new employees, and their personal comfort is being carefully looked after. On Wednesday, the 21st, the bar mill was in operation and also several sheet trains and the tinning department. Very little trouble has been experienced as yet either from breakage of rolls or inferior quality of product, and if the present rate of progress can be maintained it will not be long until the plant can be put on full in all departments. The firm are refusing positions to applicants every day, and only those who are skilled and come with good records are given employment.

The attempt of the United States Iron & Tin Plate Mfg. Company, Demmler, Pa., to operate their tin plate plant with non-union men, and which gives good promise of being successful, has resulted in a move being made by the Amalgamated Association, the outcome of which will be awaited with much interest by employer and employee alike. The move in question was the filing of a bill in equity in the courts at Pittsburgh, on Saturday, the 24th inst., by the attorney of the Amalgamated Association, asking the court to

grant a decree restraining the United States Iron & Tin Plate Mfg. Company and the officers and agents thereof from operating their tin and black plate mills at wages less than the schedule of prices agreed upon for the work performed by rollers, heaters, doublers and shearmen. The bill sets forth that on July 6 a committee from each association agreed upon a scale of wages to be paid by the firms composing the Tinned Plate Manufacturers' Association to their employees engaged as rollers, heaters, doublers and shearmen for the year ending June 30, 1895.

The case will be heard by the court on Saturday next, December 1. The filing of this suit has excited considerable speculation as to the line of defense that will be offered by the defendants. By many it is believed that the fact that the Manufacturers' Association and the Amalgamated Association are not incorporated bodies will cause the suit to be dismissed by the courts. In this connection it is pertinent to state that in addition to the agreement entered into on July 6, a resolution was adopted in conference to the effect that should a reduction in the tariff on tin and terne plate be made and a reduction in the selling price of same follow, then another conference should be held between the Manufacturers' Association and the Amalgamated Association in order to determine what reductions in the wage scale had been made necessary. As is well known, a conference was held in Pittsburgh shortly after the passage of the tariff bill, at which the manufacturers proposed a reduction of 30 per cent. in rollers' wages, 25 per cent. to heaters and 20 per cent. to shearmen and doublers. A vote was taken on this by the different lodges of the Amalgamated Association, and the vote was almost unanimous against accepting any reduction whatever. This was followed by the complete shut down of the tin plate plants operated by members of the Manufacturers' Association, with the exception of some six or seven, most of which are located in the gas fields in Indiana. Should this suit in equity be allowed to proceed to a full hearing, the question will doubtless be determined whether wage agreements are legally binding on the parties making them or not. Such a decision coming from a court would doubtless be of value to employer and employee.

PERSONAL.

James Riley has resigned the position of general manager of the Steel Company of Scotland, Limited, and accepted a similar position with the Glasgow Iron & Steel Company, Limited. Mr. Riley has been manager for the Steel Company of Scotland since 1878, having previously been at the Landore Steel Works, near Swansea, built and carried on mainly by the late Sir William Siemens.

R. A. Hatfield has severed his connection with the Warwick Iron Company, and, with his associates, under the firm name of R. A. Hatfield & Co., has opened an office in the Security Building, Pottstown, Pa., for the sale of coal, coke, Lake ores, pig iron and steel.

An act incorporating the Nicaragua Canal Company, successor to the old Construction Company which suspended last year, has passed the Vermont Legislature. The incorporators are John R. Bartlett, Smith M. Weed, Hy. E. How-

land, Richard L. Edwards, John J. Emory, Wilhelmns Mindersee and E. K. Sibley. The capital stock of the new concern is fixed at \$12,000,000.

Standard Pipe Flanges.

The result of nearly three years' labor in relation to adopting standard flanges is about to become effective, the exact time set for the new order of things being January 1, 1895. Over two years ago a committee was appointed by the American Society of Mechanical Engineers from among their members to investigate the subject of adopting standard flanges. About the same time a similar committee was appointed by the Master Steam and Hot Water Fitters' Association to consider the same subject. Cast iron flanges of pipe, steam engines, steam pumps, and valves for steam, water, &c., have been exhaustively discussed, and the table adopted, as shown in the report of the American Society of Mechanical Engineers of July 18, 1894, will be substantially the one adopted, there being a few modifications under advisement in a few of the larger sizes not commonly used. The committees were instructed to devise some standard which would be sufficiently broad to warrant its adoption by the various manufacturers. Both committees have met individually and jointly, the Master Fitters' Association, at their annual convention last June, recommending a conference of the two committees. This resulted in a meeting at the rooms of the Mechanical Engineers, July 18. At this assemblage were not only the members of both committees but representatives of the following manufacturers interested: E. P. Bates, chairman Master Steam Fitters' Association Committee; Geo. F. Blake Mfg. Company, represented by J. G. Winship; Crane Company, by Geo. T. Coppins; The Eaton, Cole & Burnham Company, by E. H. Cole, W. H. Douglas and F. A. Strong; Gillis & Geoghegan, by Stephen J. Geoghegan; Jenkins Brothers, by A. B. Jenkins; Jarecki Mfg. Company, by Oscar Jarecki; The Kelly & Jones Company, by John T. Kelly; Knowles Steam Pump Company, by J. G. Winship; Morris, Tasker & Co., Incorporated, by M. B. Feldman; McNab & Harlin Mfg. Company, by Geo. T. Coppins; Nason Mfg. Company, by Carleton W. Nason and Frank A. Bucknam; Snow Steam Pump Works, by James H. Snow; the Solvay Steam Process Company and Straight Line Engine Company, by John E. Sweet; the Walworth Mfg. Company, by Geo. T. Coppins and Levi R. Greene; the Walworth Construction & Supply Company, by A. C. Walworth; Henry R. Worthington, by A. J. Caldwell; R. D. Wood & Co., by L. R. Lemoine; the Wheeler Engineering Company, by F. M. Wheeler. Carleton W. Nason of the Nason Mfg. Company was chosen chairman and W. H. Douglas of Eaton, Cole & Burnham secretary. The fact was brought out that the work of the committees was the result of careful scientific analysis, and that the cross section paper scale they had constructed was made for the purpose of exhibiting the lines of their work as plotted graphically. The table referred to above was unanimously adopted after much critical discussion, and it was decided to have the secretary send reports to interested manufacturers stating that it was the sense of the meeting that the diameters decided on be adopted, to take effect January 1, 1895.

MANUFACTURING.

Iron and Steel.

Emile C. Caleyon, receiver of the White River Iron & Steel Company, Muncie, Ind., announces that he will offer for sale at public auction, on December 5, the entire plant of that company, including the 5 acres of ground on which it is located, at Muncie, unless the sale is made privately before that date. The plant embraces mills, machine shop, office, &c., and contains two three-high trains of rolls, together with the full necessary equipment of a first-class plant, and a supply of natural gas ample to operate the works. The shipping facilities are stated to be good, the works being connected by switches with the Big Four Railroad.

The Ellwood Ivins' Tube Company mill at Oak Lane Station, Philadelphia, is running double time. They report that contracts are in hand to keep them running in this way for nine months to come. This plant now covers over 1 1/4 acres of ground, and even this is inadequate, and preparations are being made to build an addition that will more than double the output. They make tubing from 5 inches in diameter down to a size as small as a human hair.

The La Belle Iron Works, Wheeling, West Va., manufacturers of muck bars and steel cut nails, have decided to engage in the manufacture of tin and terne plate. A force of men has already been put to work tearing down some old puddling furnaces to make room for the new buildings. The contracts for the equipment of the plant are expected to be placed this week. It will be a four-mill plant and have a capacity of between 500 and 600 boxes of tin plate per day. Work will be commenced at once, and it is hoped to have the plant ready for operation by April 1, 1895.

The National Foundry & Pipe Works, Limited, Scottdale, Pa., have contracted with the Shiffler Bridge Company of Pittsburgh, Pa., for the erection of another foundry building 80 x 301 feet, a pipe cleaning shed 30 x 301 feet and a cupola house 26 x 35 feet. The buildings will be constructed of iron and are to be completed within 90 days. The Industrial Works of Bay City, Mich., secured the contract for furnishing four 30-ton cranes and one 10-ton locomotive crane. A boiler and engine house, also of iron, will be built but the contract has not been let yet.

The Spring Lake Iron Company's charcoal furnace, at Spring Lake, Mich., was to be started last week after a long period of idleness.

The East Chicago Iron & Steel Company of East Chicago, Ind., have purchased additional machinery from the Lloyd Booth Company of Youngstown, Ohio. Included in it is a machine to straighten angle iron.

The Illinois Iron & Bolt Company of Carpentersville, Ill., are well employed in most departments, but are by no means driven to their utmost capacity. They have just added to their equipment a large shear, built by the Long & Alstatter Company of Hamilton, Ohio. The blade of this shear is 18 inches long. It will be used for cutting plates and round iron, being designed to cut plates up to 1 1/8 inches thick and round iron up to 2 inches in diameter.

The Beaver Dam Malleable Iron Company of Beaver Dam, Wis., have increased their capital stock from \$30,000 to \$45,000, for the purpose of making considerable improvements in their plant.

Morris Sellers & Co. of Chicago, manufacturers of splice bars and railroad spikes, confessed judgment on the 20th ult. for \$25,074. The confession was entered in favor of George P. Jones, a dealer in commercial paper. There were three judgment notes executed originally to the Metropolitan National Bank for \$11,000, \$10,000 and \$4000 and transferred by the bank to Jones. The writ of execution was put in the hands of the sheriff with instructions to levy on the rolling mills of the corporation on West Chicago avenue and the north branch. It is understood that the apparent financial difficulty is the outcome of a disagreement between stockholders. Morris Sellers is not personally involved, as he has other large interests in manufacturing and mining enterprises.

Negotiations have been progressing between the Troy Steel & Iron Company of Troy, N. Y., and the representatives of the Mannesmann tube rolling process. No conclusion has been arrived at as yet.

The black plate mills now under erection by the Canonsburg Iron & Steel Company, at Canonsburg, Pa., are being built by Riter & Conley of Pittsburgh, while the rolls and housings are being furnished by the A. Garrison Foundry Company of that city.

Last week there were 3557 names on the pay roll of the Pennsylvania Steel Company, Steelton, Pa., and to these employees \$80,355 was paid out on Saturday, the 24th inst., for two weeks' work.

In regard to the statement that the plant of the Ohio Iron Company, Zanesville, Ohio, would resume operations, giving employment to 700 men, we are officially advised that this plant has been in partial operation right along for the last two years. There has been no change decided upon for the future.

The Leesport Iron Company of Leesport, Pa., have blown in their furnace.

The Donaldson Iron Company of Emmaus, Pa., have had their newly erected 96-foot addition to their pipe mill put under roof, and as soon as it has been completed an 80-foot annex will be built to the other end of the mill to make place for four new pits. A 16-foot addition to the carpenter shop will also be built. They are also about erecting a new apparatus for hoisting and mixing sand, obviating the elevation of about 50 per cent. of dust which is raised under the existing arrangement and makes the work exceedingly dirty and disagreeable.

The Spearman Iron Company of Sharpsville, Pa., will erect a new blast furnace, the plans for which are being prepared by Julian Kennedy of Pittsburgh. The stack will be 75 feet in height, and will occupy the site of the old furnace. The work of construction will begin in December or early in January, and it is hoped to have the furnace completed by July 1. A new casting house will also be erected.

The real estate and blast furnace of the Embreeville Freehold Land, Iron & Railway Company, Limited, at Embreeville, Tenn., have been sold to T. A. Parker for \$100,000. It is announced that the furnace will be started up at an early date. The stack, which is 80 x 19 feet, was first blown in 1892, and has an annual capacity rated at 54,000 gross tons.

Machinery.

The American Mining Machine Company of Pittsburgh have made application for a charter of incorporation. The incorporators are: George Francis Myers, Reed B. Coyle, A. C. Munhall, Louis L. Broughton and J. H. Palmer.

In reference to the reported cut of 20 per cent. in the wages of the employees of the Westinghouse Air Brake Company, Wimberding, Pa., H. H. Westinghouse, general manager, states that wages paid at this plant are for piece work and through a rearrangement of methods wage changes follow almost continuously.

The machinery for the new plant of the Westinghouse Electric & Mfg Company, at Brinton, near Pittsburgh, is being placed with all possible haste, and the manufacture of electrical machinery and supplies of all kinds will be commenced within a short time. It is stated that this concern have unfulfilled orders which aggregate in value nearly \$1,500,000. On account of the concentration of the works several changes have been ordered in the active management. W. F. Zimmerman, formerly assistant general manager, has been made general Eastern agent, with office at 120 Broadway, New York. W. C. Clark, formerly assistant treasurer and general agent, has been made assistant general manager, with office in Pittsburgh; George H. Lewars, formerly treasurer of the Consolidated Electric Light Company, has been elected assistant treasurer to take effect December 1, with office in Pittsburgh; Albert Schmid, formerly superintendent, has been made general superintendent; Philip Langen, formerly assistant superintendent of the Newark, N. J., factory, has been made superintendent of the Brinton works.

The Elwood Iron Works of Elwood, Ind., assigned on the 17th inst. to James Louis. These works manufacture steam and hot water radiators and general machinery. They have latterly done considerable work in equipping tinning plants. It is stated that the radiator department is to be separated from the rest of the works and run as an independent business.

Aultman, Miller & Co., Akron, Ohio, manufacturers of Buckeye harvesting machines and binder twine, started up their

cord factories early in September and have been operating them ever since night and day. The machine shops of this firm are about starting up, and it is expected that the output of machines for 1895 will be much larger than for this year on account of increased facilities in the way of a new foundry and improved appliances added to their machine shops.

The plant of the Orient Electric Company, Youngstown, Ohio, has been closed down on account of the courts allowing a restraining order until the validity of certain Edison patents had been determined, and these patents having now expired, the plant of this concern has been put in full operation, and they are now ready to supply their customers with their high grade Orient lamp.

The pump factory of Downey Brothers, at Downeyville, Pa., was totally destroyed by fire on the night of the 22d inst. These works were formerly located at New Brighton, Pa., but were removed to Downeyville about a year ago.

The Oakland Iron Works of Oakland, Cal., recently partly destroyed by fire, will be rebuilt in a more substantial manner and in such a way as will give additional facilities for work as well as enabling the company to do work at a much lower figure than in the old establishment. This is owing to the improved machinery which is to be introduced for handling material. The company will erect a shop 100 x 100, all under one roof, but which will be divided into three parts by the columns used to sustain the roof. There will be a powerful traveling crane in each, capable of holding any piece of machinery or material not over 22 feet high and not weighing more than 15 tons. The company have replaced their machinery in other temporary quarters and got every department again in working order. To do this they have not been called on to buy much, but have manufactured everything needed right in their own works. They now have two sites of 100 x 150 feet each, one on the north side of Second street and the other on the south side. The brass and iron foundry and pattern shops are on the south side, while the new shop, which is to contain the machinery, boiler and blacksmith shop and the office, with drafting rooms, storage and store rooms, is on the north side of the street.

Among recently organized corporations in Illinois are the following: American Gas Engine Electric Company, Chicago; capital stock, \$250,000; incorporators, F. M. Charlton, John D. W. Rowe and Erik Akerberg. Middleby Oven Mfg. Company, at Chicago; capital stock, \$25,000; for the manufacture of bakers' ovens, stoves and lamps; incorporators, John L. Marshall, Howard L. Smith and Arthur W. Underwood. Davies Car Wheel & Machine Company, Chicago; capital stock, \$150,000; incorporators, C. E. Gaylord, J. H. Lee and M. J. Frost.

The Philadelphia Machine Screw Works, 624-6 Race street, Philadelphia, are calling the attention of the trade to their facilities for manufacturing machine screws, studs and kindred goods. They are a new concern and start out with a newly equipped and convenient factory, which is under the management of W. C. Huston, who has had many years of experience in the line. Though in business but a few weeks, they report a good trade, which they will endeavor to maintain by careful attention to the requirements of their customers.

The Whiting Foundry Equipment Company of Chicago have shipped a large Whiting cupola to the Santa Ana Foundry & Machine Company, Santa Ana, Cal.

The Fairhaven Iron Foundry Company, Fairhaven, Mass., have added a second Whiting cupola to their foundry.

The Berlin Iron Bridge Company of East Berlin, Conn., have just completed for the Baldwin Locomotive Works of Philadelphia, Pa., steel roof trusses for the addition to their wheel shop.

The Lackawanna Iron & Steel Company of Scranton, Pa., have begun the work of erecting a new boiler shop, the dimensions of which will be 239 x 78 feet.

It is stated that the plant of the Jas. P. Witherow Company, engineers and contractors, which is located at New Castle, Pa., will be put in operation, provided a loan of \$35,000 can be secured on the blast furnace of the Sheffield Furnace Company, Sheffield, Ala., now owned by the first named concern.

The Dickerman Emery Wheel & Machine Company have been organized at Bridgeport,

Conn., for the purpose of manufacturing and selling all kinds of emery wheels and machinery. The capital stock is \$40,000, of which 20 per cent. has been paid in.

It is stated that plans have been prepared for enlarging the new works of the Ingersoll-Sergeant Drill Company at Ogdensburg, Pa.

The Industrial Works of Homer have been organized, at Homer, N. Y., for the purpose of manufacturing the Rumsey patent friction clutch pulley and a general line of friction clutches and countershafts.

Hardware.

White & Ham, Honesdale, Pa., whose axe and edge tool works were destroyed by fire on the 16th inst., as noted in our last issue, advise us that they have already commenced to rebuild, and expect to be in full blast again in two months' time.

Baackes & Co., Pittsburgh, Pa., advise us that they have arranged to take the output of the Ashley Mill, at Joliet, Ill., and the mill is now in operation. At the present time it is running exclusively on barb wire, but the firm expect to be able to furnish nails and market wire later on. They state that their New Philadelphia mill is running day and night on nails, their Cuyahoga Falls mill on mattress and broom wire, and the Cleveland mill on the finer kinds of wire for poultry netting, &c.

The wire nail works of Carnegie, Phipps & Co., at Beaver Falls, Pa., were destroyed on the 23d inst. The total loss will, it is thought, reach \$100,000, fully insured. Two hundred men have been thrown out of employment.

The plant of the Keystone Fiber Company, Stroudsburg, Pa., was destroyed by fire on the 2d inst., caused by an explosion in the bake oven. The loss is \$25,000, partly covered by insurance.

Over half of the force of employees of the Bradley & Hubbard Mfg. Company, Meriden, Conn., are working nights until nine o'clock, five nights in the week. Business is reported better than it has been for a year and a half.

The Ansonia Brass & Copper Company, Ansonia, Conn., are intending to make extensive improvements in their brass mill. This consists of a cluster of small wooden buildings erected from time to time as increased room was needed. It is contemplated to build substantial foundations around these buildings, put an iron roof over the whole, and then tear out the old structures, making one large plant. The two engines now furnishing power will be replaced by a much larger one. These improvements have been delayed, but it is expected that they will be completed by early spring.

The National Skewer Company, Muncie, Ind., have started their factory at Jackson, Tenn., and the factories at Marion and Muncie, Ind., and Geneva, Ohio, will be closed down. The offices will remain at Muncie. The object of the new location is to get to the timber. The factory will employ 200 hands.

The Rivers Stepladder Mfg. Company, St. Louis, Mo., have been incorporated, with a capital stock of \$50,000. The incorporators are Campbell Rivers, Henry C. McKee and Joseph A. Duffy.

A company for the manufacture of lawn mowers is being organized at Troy, N. Y. The company will have a capital of \$10,000, of which about \$6000 has already been subscribed.

B. W. Rayl, Beaver Falls, Pa., has recently purchased all the stock, fixtures, machinery, &c., of the Peerless Wire Mat & Hammock Company of Beaver Falls, Pa. A new company have been organized under the style of Home Mfg. Company, Limited, the officers of which are as follows: John Ferguson, president; Robt. G. Johnston, vice-president; B. W. Rayl, secretary and treasurer, and S. A. Johnston, manager. The new concern will engage in the manufacture of Peerless flexible matting of all kinds, galvanized steel wire hammocks and other wire specialties.

A committee consisting of an employee from each of the Interior, Treasury and Post Office Departments, selected to examine into the post office lock boxes submitted for the Government's annual supply, have decided unanimously in favor of the lock box and lock submitted by the Yale & Towne Mfg. Company, Stamford, Conn. This, we are advised, makes the seventeenth consecutive year that the company have succeeded in obtaining the contract, which covers all the lock boxes used by the United

States Government in the post office buildings erected by it.

The Eureka Tackle Block Factory of Cincinnati have just completed a large order for the Phoenix Iron Company of Philadelphia, Pa., to be used in the erection of the new viaduct, at Cincinnati, running from the C. & O. R. R. tracks to the Kenyon Coal Company's yards. This order includes some of their largest size blocks.

One of the oldest manufacturing concerns in this country, at the present time, is the firm of C. C. & E. P. Townsend, manufacturers of wire, rivets and wire nails, whose offices and works are located at New Brighton, Pa. The business of this concern was first established in the above place in 1816 under the firm name of R. Townsend & Co. The business was carried on under this title for nearly 50 years, or until 1864, when Robert Townsend, father of Wm. P. Townsend, retired, and the latter with his sons, C. C. and E. P. Townsend, continued the business under the style of Wm. P. Townsend & Co. until January 1, 1894. On that date W. P. Townsend retired and since then the firm name has been C. C. & E. P. Townsend. Wm. P. Townsend died on September 27, 1894. The trade of this firm extends over a large section of the United States, and their goods have an enviable reputation. Owing to severe competition and low prices ruling for their product, this firm have been compelled to make a slight reduction in wages, which their employees accepted at once and without hesitation.

F. E. Myers & Co., Ashland, Ohio, manufacturers of pumps and hay tools, have one of the most complete factories in their line in the country. In their manufacturing department they have three rooms, 300 feet long and 52 feet wide, which they are now equipping with additional machinery and elevators, and in the most convenient and substantial manner, with a view of being able to produce goods of a high grade at a range of cost that will enable them to meet the views of the trade. The storage room of this firm consists of three rooms 200 feet long and 50 feet wide. Their factory is large and roomy, and is equipped with latest pattern of 5-ton Colliau cupola, so that the additions which have been made and the rearrangement of their factory throughout will give this firm what can be considered as an up to date manufacturing plant.

Silver & Co., 304 to 310 Hewes street, Brooklyn, manufacturers of house furnishing specialties, have contracted for important additions to their plant in order to meet the increasing business which each month brings to them. Two years ago the present buildings were considered too extensive for their requirements, but they have become already too small to accommodate the growing needs of their business in its various branches. The factory contains departments for the manufacture of stamped and pieced tinware, for nickel plating, polishing and grinding, a blacksmith shop, japanning and tinning departments, glass blowing, sheet iron and metal working, and the manufacture of aluminum utensils. The last named branch has grown to large proportions in the four or five months in which the firm have undertaken this work. The existing plant includes a four-story and basement building, corner of Broadway and Hewes street, containing about 40,000 square feet of floor space, devoted exclusively to the manufacture of the firm's house furnishing inventions, and two smaller buildings adjoining. All this space is overcrowded. For the past three weeks the factory has been running night and day to keep abreast of orders, and November has been the banner month of the firm's existence.

MISCELLANEOUS.

The Crescent Mfg. Company of Detroit, Mich., are arranging for the removal of their plant to Muskegon, Mich. They make patent nail kegs, formed of two staves only, which are shipped apart to consumers, who finish cooping them. They expect to be turning out 10,000 kegs daily by March 1.

The Milwaukee Variety Iron Works, bridge builders, of which A. T. Riddell and E. S. Morris are proprietors, have made an assignment to S. R. Bell.

At Pittsburgh, last week, the jury in the case of the Denver Consolidated Electric Company against the Standard Underground Cable Company of Pittsburgh, returned a verdict for \$36,625 in favor of the plaintiffs. The claim was for \$52,000 re-bate on alleged defective goods furnished by the defendants, and the trial of the case

consumed an entire week. It is probable that a new trial will be asked for by the defendants.

The Shiffler Bridge Company of Pittsburgh, Pa., have received the contract for the erection of a foundry building for the Scottdale Iron & Steel Company, Limited, Scottdale, Pa.

The International Steel Post Company, St. Louis, report a very heavy demand for their posts. They are supplying the Big Four Railroad and have sold them many miles of these posts. Recent tests in operating these posts show that they can place in position 38 of the International steel posts while holes are being dug for two of the old style wooden posts. In addition to the rapidity of setting these posts the claim is made that being made of steel, they are proof against fire, vermin and decay.

The contract for rebuilding the Bettendorf Metal Wheel Works, at Davenport, Iowa, has been awarded to Riter & Conley of Pittsburgh. They will erect an all steel building, 70 x 340 feet in dimensions, with walls of 18 feet, and a high roof with ventilators. Added to this is to be a wing 64 x 68 feet in area, of the same style of construction. The portion of the present brick building that has been occupied by the office of the company will be repaired and retained for that purpose. It will be separated from the new structure by a fire wall. The contract calls for the completion of the work by January 1. The new factory will start off, when it is opened, with an increase of 60 per cent. in its capacity.

The shops of the Michigan division of the Big Four Railroad, which were burned a short time since, will be rebuilt at Wabash, Ind., on a much more extensive scale.

A new corporation, to be known as the Kingston Car Wheel Company, has been organized at Kingston, Pa., with a capital stock of \$20,000, for the purpose of manufacturing car wheels.

The Balanced Locomotive & Engine Company, capital \$1,000,000, have been incorporated at Albany, N. Y. The objects of the company are to manufacture and sell boilers, steam engines, locomotives, &c., and to contract for and erect power plants. The stock is divided into 10,000 shares of \$100 each, and the company's principal office will be in New York City. The directors are: Henry Warden, owning 900 shares of the stock, George D. McCreary, 100 shares, both of Philadelphia; George S. Strong, who takes 100 shares by subscription, and 4500 additional to be paid for by property, and Joseph Bushnell, 10 shares, both of New York City; George S. Morris, 100 shares, of Chicago; James MacNaughton, 100 shares, of Albany, and Robert G. Bushnell, 100 shares, of Morristown, N. J. Henry F. Taintor of New York and Henry G. Morris of Philadelphia, as trustees for the bondholders of the Strong Locomotive Company, take 1500 shares, which is to be paid for by property.

The Kellogg Steel & Iron Company of Buffalo, N. Y., have been incorporated, with a capital stock of \$5000, for the purpose of constructing, designing, buying and selling bridges, buildings and structures of iron or steel. The directors are Thos. H. Brooks of Cleveland, Chas. H. Kellogg, and Peter C. Newkirk of Buffalo.

It is reported that the Standard Underground Cable Company of Pittsburgh have enough orders on their books to insure steady operations of their plant for almost a year.

The statistics of the New York Produce Exchange show that 36,879,000 bushels of grain, flour and meal were carried by the Erie Canal to New York this season, as against 36,775,000 bushels last year. Rail shipments were at the same time only 35,474,000 bushels, against 55,495,000 in 1893. Thus, while there was a heavy decrease in the rail freight, canal shipments showed a slight increase.

A dispatch from Topeka, Kan., says that three-fourths of the fall wheat crop sown in Western Kansas is ruined by the continued drought.

We understand that the Mannesmann tube mill, at the works of Benedict & Burnham, Waterbury, is running successfully.

The Iron and Metal Trades.

We are in the position to make the official announcement that an arrangement has been arrived at by the Steel Rail manufacturers for the year 1895. They have decided to lower the price \$2 1/2 ton on all Rails 45 lb per yard and upward, thus making the price \$22 East and \$23 West.

It is of course too early to judge what effect this action will have upon buyers, since the new quotations have only been out a few days. In the trade generally opinions are divided. It is urged on the one hand that requirements must necessarily be heavier this year than they have been, even when due consideration is given to the wretched financial condition of many great systems. Others insist that the necessity for the strictest economy will keep even strong buyers out of the market, and that there is no inducement to them to give out winter work.

The Iron trade is more particularly interested in the matter so far as it bears upon the general business for the months intervening before spring, the feeling being that then the trade can take care of itself without any reference to the large Rail concerns.

An important fact is that Coke contracts have been made for delivery during the first quarter of 1895 at \$1 1/2 ton at oven. With the cheap Lake Ore available, that means continued low cost of production for that period. Reports have it that \$10.25 at Pittsburgh for Bessemer Pig has been reached.

Steel Billets have been weak, and it is openly asserted that \$15 at Pittsburgh has been done for moderate quantities. In Eastern Pennsylvania, \$17.50 has been shaded. In other words, Steel is back again to the lowest point which it struck before the Coke strike, last summer, although Bessemer Pig is not as cheap as it was then. The present price allows only the best equipped Steel works to come out whole.

Although the outlook is good for the heaviest demand for Architectural Iron ever experienced in this country; although there is some chance for the shipbuilders; although big work is coming out in bridge building, and even the locomotive works and car shops are beginning to stir, the fact remains that there is not enough to go around for the winter.

In the Foundry Pig Iron trade there is more activity in Western centers, but apparently at the expense of prices, which are irregular. Makers do not seem to have much confidence in the first quarter of next year, since they are willing enough to contract at present prices for that period.

Tin has continued its downward tendency and 13.70¢ was touched during the week. There have been reports of a round sale of Copper, but they lack confirmation. Lead is weaker under low offerings of foreign metal and Spelter continues very flat.

Chicago.

(By Telegraph.)

Office of *The Iron Age*, 59 Dearborn street, Chicago. November 28, 1894.

Pig Iron.—Local Coke Iron has had another week of much better business than had been anticipated. The largest order placed was one of 2000 tons, but numerous other contracts were made for 200 to 500 tons, while carload orders were plentiful. Shipments are extraordinarily good; hardly a case exists in which deliveries are not running ahead of the monthly quantity stipulated. Foundry Iron is not any dearer, but indications appear to favor an upward movement in Bessemer. This class of Iron has long been relatively much cheaper in Chicago than any of the other Iron centers. The consumption is now so large that a good basis exists for asking a better price. Southern Iron is in only moderate demand with some irregularity in prices. The large companies are very firm, but the smaller concerns are making concessions in order to secure orders. An increased business is reported in Lake Superior Charcoal, more tonnage now being booked than for a long time. Orders are not large, but their number is steadily growing. Quotations are given as follows for cash:

Lake Superior Charcoal	....	\$13.00	@	\$13.50
Local Coke Foundry, No. 1.	10.12½	10.25	@	10.25
Local Coke Foundry, No. 2.	9.50	9.75	@	9.75
Local Coke Foundry, No. 3.	9.25	9.50	@	9.50
Local Scotch.	10.25	11.00	@	11.00
Ohio Strong Softeners No. 1	12.50	13.00	@	13.00
Southern Silvery, No. 1.	11.50	11.75	@	11.75
Southern Silvery, No. 2.	11.25	11.50	@	11.50
Southern Coke, No. 2.	10.25	10.50	@	10.50
Southern Coke, No. 3.	9.75	10.25	@	10.25
Southern, No. 1. Soft.	10.25	10.50	@	10.50
Southern, No. 2. Soft.	10.00	10.25	@	10.25
Alabama Car Wheel.	17.50	18.00	@	18.00
Jackson County Silvery.	15.50	16.00	@	16.00
Other Ohio Silvery.	14.25	14.50	@	14.50
Coke Bessemer.	11.00	11.25	@	11.25
Coke Malleable.	11.00	11.25	@	11.25
Spiegeleisen 20%.	....	26.00	@	26.00

Bars.—The improved demand noted last week keeps up very well. Among the orders recently placed was one for 600 tons of Car Iron on private terms. A number of other good sized transactions are also reported and a much better feeling prevails throughout the trade. General quotations on mill shipments of Common Iron are continued at 1.05¢ @ 1.10¢, Chicago, but these prices are shaded on anything like desirable specifications. Guaranteed Iron is still quoted at 1.15¢ @ 1.20¢. Soft Steel Bars, from strictly Billet stock, stand at 1.15¢ @ 1.25¢, Chicago. Jobbers' trade at present is one of fits and starts. Some report more doing and others less than the previous week. Individual orders are small, but the aggregate makes a fair volume of business. They quote small lots from stock at 1.15¢ upward for Iron and 1.30¢ upward for Soft Steel.

Structural Material.—Notwithstanding the lateness of the season, small orders continue to come in freely for Building Shapes. The Bridge works are also well employed and are steadily drawing on manufacturers for material. Quotations for mill shipments, Chicago delivery, are as follows: Beams and Channels, 1.50¢; Angles, 1.40¢ @ 1.45¢; Tees, 1.65¢; Universal Plates, 1.40¢ @ 1.45¢. Small lots of Beams and Channels from stock, 1.75¢ @ 1.85¢; Angles, 1.50¢ @ 1.60¢; Tees, 1.70¢ @ 1.80¢. A typographical error was made last week in the price of small lots of beams from stock.

Plates.—Business in this line has been steadily increasing for some time, and is now very good for the time of the year. The boiler makers are better

employed than at any time previous this season. They are taking a fair number of boiler contracts, but their repair business keeps them quite busy. The increased tonnage moving seems to have no effect in stiffening prices. We continue prices on mill shipments, Chicago delivery, as follows: Tank Steel, 1.35¢ @ 1.40¢; Flange Steel, 1.65¢ @ 2.10¢; Fire Box, 1.65¢ @ 5¢. Store prices are as follows: Iron or Steel Sheets, Nos. 10 to 14, 1.70¢ @ 1.80¢; Tank Steel, 1.50¢ @ 1.65¢; Flange Steel, 2¢ @ 2.15¢; Boiler Tubes, in carloads, 75% off.

Sheets.—The demand for Black Sheets is smaller than at any time during the year, and the Sheet mills are now getting a taste of the dullness which other branches suffered earlier in the season. A little better inquiry is noted for Galvanized Sheets, but it has thus far resulted in few contracts being placed. Mill shipments are still quoted at 2.30¢ @ 2.35¢, Chicago, for No. 27 Common; 2.40¢ @ 2.45¢ for Steel Sheets and 80% off for Galvanized Sheets. Small lots of Sheet Copper are selling at 14¢ base, but good buyers are purchasing at 10% off. Small lots of No. 27 Common Sheets are sold from stock at 2.40¢ @ 2.50¢, and Galvanized Sheets 75 and 10% off.

Merchant Steel.—Manufacturers' agents have enjoyed a better business during the week, and inquiries are of a character to indicate a still larger volume for the immediate future. Mill shipments, Chicago delivery, are quoted as follows: Smooth Finished Machinery Steel, 1.50¢ @ 1.60¢; Smooth Finished Tire, 1.50¢ @ 1.60¢; Open Hearth Spring Steel, 1.75¢ @ 1.80¢; Ordinary Tool Steel, 5½¢ @ 7¢; Specials, 10¢ and upward.

Billets and Rods.—The demand for both Billets and Rods continues strong. Large contracts are pending for delivery during next year. Prices here are continued at \$17 for Billets and \$23.50 for Wire Rods. Low prices named further East on Billets and Rods are claimed to be made by brokers and not by manufacturers. The makers are of the opinion that this is a better time to buy than to sell material. There is every indication that next year will be extremely active, as the consumption of this class of material promises a considerable increase.

Rails and Track Supplies.—Some Southwestern business is in sight which will supply at least one of the Western mills with work for the coming month. The local mill, however, will probably close for repairs about the middle of December. Feelers are being thrown out by the railroads for next year, but negotiations so far have not come to any definite conclusion. Perhaps the new agreement, which has just been effected by the manufacturers, fixing \$23 as the Chicago price, may result in early contracting. Quotations are continued as follows: Steel Splice Bars, 1.30¢ @ 1.35¢; Track Bolts, with Hexagon Nuts, 1.90¢ @ 2¢; Spikes, 1.60¢ @ 1.70¢; Links and Pins, 1.60¢ @ 1.70¢.

Old Rails and Car Wheels.—Railroad companies are now offering more freely their stocks of Old Material, but dealers and consumers are not inclined to purchase unless they can secure actual bargains. Nominal quotations on Old Iron Rails range from \$10.75 to \$11.25, according to quantity and terms of sale. Old Steel Rails are quoted at \$7 @ \$9, according to length and condition. Old Car Wheels are quoted at \$9 @ \$9.50.

Scrap.—The market is overshadowed by the efforts of railroads to dispose of their accumulations of Old Material. Large quantities are being offered by companies that have hitherto refused to sell to any extent at the low rates recently prevailing. They now appear to be anxious to get cash from all available sources and will therefore attempt to lessen their stocks of Old Material. Next week's report may, therefore, show some decided changes in prices. Meanwhile dealers quote the following selling prices per net ton: Railroad Forge, \$8.50; Dealers' Forge, \$8; No. 1 Mill, \$7; Pipes and Flues, \$7; Axles, \$12.75; Heavy Cast, \$7.50 @ \$7.75; Stove Plates, \$5.50 @ \$6; Cast Borings, \$3.50; Wrought Turnings, \$5.50; Axle Turnings, \$6.25; Fish Plates, \$9.50; Horseshoes, \$9.25; Mixed Steel, gross ton, \$6; Heavy Melting Steel Scrap, \$7 @ \$7.50.

Metals.—Lake Copper has not advanced as was expected last week, but on the contrary has receded slightly and is quoted at 9 $\frac{1}{4}$ ¢ for carload lots. Casting copper continues quiet at 9.50¢, quoted. Spelter is being forced down; prime Western is offered at 3.25¢ in carload lots, but some brands can be had considerably cheaper. The demand is very light. Pig Lead is easier, owing to the decline in the foreign price, which has caused weakness here. It is influenced closely by the foreign price, owing to the shortage in the domestic supply. It is now freely quoted at 2.95¢ for futures, with 2.90¢ bid. A few hundred tons were sold during the week at 2.95¢ @ 2.97 $\frac{1}{2}$ ¢.

Pickands, Brown & Co., The Rookery, Chicago, have been appointed sole selling agents for the Spring Lake Iron Company, manufacturers of Lake Superior Charcoal Pig Iron. The company's furnace is now in successful operation after a period of idleness, during which extensive repairs were made. The Spring Lake brand of Charcoal Iron has been long and favorably known in the market and its reputation will be fully sustained.

C. A. Ridgely, room 711 Western Union Building, Chicago, has been appointed exclusive Chicago agent for the sale of the Links and Pins made by the Oliver Iron & Steel Company of Pittsburgh. He has also about completed arrangements for the sale of Railroad Spikes. Mr. Ridgely will continue to handle all the products of the Springfield Iron Company as heretofore.

W. C. Brown, 45 La Salle street, Chicago, has been appointed agent for the sale of Tin and Terne Plates manufactured by the Old Dominion Iron & Nail Works Company of Richmond, Va. They have just completed the first Tin Plate plant in the South.

The Chicago Shipbuilding Company have just completed a large dry dock at their yards at South Chicago. It will accommodate any boat on the Great Lakes, with considerable room to spare. It is 420 feet long in the clear, 100 feet wide at the top, and 80 feet at the bottom. The great iron gate that stands as a barrier between the dock and Lake Michigan is 70 feet in the clear. When the dock is filled the water is 18 feet over datum line. The pumps which empty the dock are rated to handle 50,000 gallons of water a minute, and will do better than that if crowded. They are capable of emptying the dock in a little over two hours. This dry dock has long been needed at Chicago and will be greatly appreciated by the vast shipping interests of that lake port.

Philadelphia.

Office of *The Iron Age*, 220 South Fourth St.,
PHILADELPHIA, Pa., November 27, 1894.

The situation in the Iron and Steel trade is much the same as noted a week ago, and at the moment there appears to be nothing in sight likely to lead to any decided change, either for better or worse. The end of the year is so near at hand that there is no inducement for heavy buying, and as prices are inclined toward weakness, consumers are taking as little material as possible. On the other hand, makers are not crowding the market, as their margin is too small to permit of any further cut in prices, although they are nearly all willing to meet such demand as there is at inside figures, hoping that with the heavier business expected after the Christmas holidays, they may be able to get things on a better paying basis than they are at present. Summarizing the results of the week's business in a few words, it may be said that while the indications are favorable for a better business after the turn of the year, the immediate situation denotes slightly easier prices and less disposition to place orders for forward delivery. It is significant to note, however, that deliveries are called for with the utmost urgency, showing that stocks in consumers' hands are light, and that whatever new business comes in must be covered at once by corresponding purchases of raw material.

Pig Iron.—The demand is quite active, considering the season, and tardiness in making deliveries is a matter of general complaint among consumers. Furnaces are evidently carrying very little Iron, although they are entering orders for 1895 delivery for almost all that a buyer is willing to engage at current quotations. In some cases the opportunity is accepted for deliveries running for a period extending three or four months, but it cannot be said that there is any general disposition to abandon the policy of hand-to-mouth buying, especially while prices continue as they are to-day—easy, if not weak. General quotations for Philadelphia and nearby points are about as follows, with a reduction of 25¢ @ 30¢ for such deliveries as Baltimore, York, Harrisburg, &c.:

Bessemer.....	\$12.50	@ \$12.75
Standard No. 1 Foundry X.....	\$12.50	@ \$13.00
Standard No. 2 Foundry X.....	11.50	@ 11.75
No. 2 Plain.....	10.75	@ 11.00
No. 1 Soft.....	11.50	@ 11.75
No. 2 Soft.....	10.75	@ 11.00
Standard Gray Forge.....	10.50	@ 10.75
Ordinary.....	.....	@ 10.25

Steel Billets.—The demand is rather light, the weakness in prices in Pittsburgh having a depressing effect on buyers. Some heavy purchases were made two or three weeks ago at a figure something below \$18, delivered, which at that time was considered an inside rate. Since then there has been very little demand, and prices to-day are almost as low as at any time during the year. Sellers quote \$17.75, but bids at 25¢ less have been accepted, and it is intimated to-day that still better terms could be had providing the right kind of an offer was presented. Consumers are very "offish," however, and not inclined to increase their lines until general business shows more activity.

Finished Material.—The demand has varied very little from that during several preceding weeks, the average being possibly a trifle smaller than during September and October, with prices also a little on the down grade. Small lots are called for with some urgency, but large orders are not in sight, and

hardly likely to be during the balance of the year. Competition is very close, and no opportunity is lost of raking in anything that will help to tide over the dull period which is now felt to be close at hand. A few small orders for Structural Material, with some for Boiler and Tank work, comprise the major portion of the week's business, and so far as can be seen that is about all that can be expected during the coming month. Prices are very weak, and when the orders are large enough to warrant it concessions can be had from the asking prices, which are usually as follows:

Grooved Skelp.....	1.20¢	@ 1.25¢
Standard Refined Bars.....	1.20¢	@ 1.25¢
Medium quality.....	1.10¢	@ 1.15¢
Tank Steel.....	1.30¢	@ 1.35¢
Heavy Plates.....	1.30¢	@ 1.40¢
Shell.....	1.50¢	@ 1.60¢
Flange.....	1.60¢	@ 1.80¢
Angles.....	1.40¢	@ 1.50¢
Beams and Channels.....	1.50¢	@ 1.60¢

Old Material.—Stocks seem to be gradually melting away, and under a good demand holders are securing better prices, according to what the article may be. Ordinarily quotations for lots delivered are about as follows:

Heavy Melting Steel.....	\$10.00	@ \$11.00
Light Melting Steel.....	8.00	@ 8.50
No. 1 Wrought Scrap.....	11.00	@ 11.50
Machinery Cast.....	9.00	@ 10.00
Wrought Turnings.....	8.00	@ 8.50
Cast Borings.....	6.25	@ 6.75
Old Iron Rails.....	12.00	@ 12.50
Old Car Wheels.....	10.00	@ 10.25
Old Iron Axles.....	15.50	@ 16.50

St. Louis.

(By Telegraph.)

Office of *The Iron Age*,
Bank of Commerce Building,
St. Louis, November 28, 1894.

Pig Iron.—The situation remains practically unchanged. There are no new contracts being made, for the reason that most consumers are anxious to work their stock down to the lowest possible point, so that they will be able to wind up the year without carrying over heavy stocks of Iron. As heretofore, the demand runs largely to carload orders, with an occasional 200 ton lot. Prices are unchanged, and in the absence of any large inquiry are well maintained. We quote as follows for cash, f.o.b. cars St. Louis:

Southern Coke, No. 1 Foundry dry.....	\$10.75	@ \$11.00
Southern Coke, No. 2 Foundry dry.....	9.75	@ 10.00
Southern Coke, No. 3 Foundry dry.....	9.50	@ 9.75
Southern Car Wheel.....	16.50	@ 17.00
Gray Forge.....	9.00	@ 9.25
Ohio Softeners.....	14.00	@ 14.50

Bar Iron.—The improved demand noted in our last report continues and most of the low priced Iron has been withdrawn from the market. Car manufacturers are fairly busy, and the jobbing trade is excellent, so that there is fair average demand all around. Mills quote 1¢ @ 1.05¢ for carload lots from mill.

Barb Wire.—The market continues in the unsatisfactory condition last noted. It is reported that an effort is being made to bring manufacturers to an understanding similar to the agreement which prevailed prior to October 1. At this writing a meeting of the manufacturers is being held in Chicago, which may bring order out of chaos. In the mean time mills have gone into the market and sold largely for spring delivery at present ruling prices, thus complicating matters and making the formation of another combination difficult. Mills quote \$1.65 for Painted, in carload lots, and Galvanized at \$2.05.

Wire Nails.—All sorts of rumors are prevalent regarding low prices which are being made on Wire Nails. There is not much doing in the way of sales, but the persistent offering by mills and jobbers has weakened the market very materially. Jobbers continue to quote \$1.10 @ \$1.15 for lots from store.

Rails and Track Supplies.—There is some slight improvement in this department. Railroads are increasing their orders both in volume and number. Track Supplies are quoted as follows: Splice Bars, 1.15¢ @ 1.20¢; Spikes, 1.60¢ @ 1.65¢; Bolts, Square Nuts, 1.75¢; with Hexagon Nuts, 1.85¢; Steel Links and Pins, 1.50¢; Iron, 1.60¢; Steel Rails are dull at \$26.50 @ \$27; Old Iron Rails a trifle more active at \$10.50 @ \$11.

Pig Lead.—Dealings in this metal have been limited to carload lots, at about 2.90¢, with offerings for prompt shipment at 2.85¢. The general tone of the market is weak and unsettled and lower prices seem certain.

Spelter.—At 3.12½¢ some few lots of Spelter have been sold, but the demand is anything but steady. Consumers buy only as their immediate needs require, and are not disposed to anticipate their wants beyond the end of the year.

Cincinnati.

(By Telegraph.)

Office of *The Iron Age*, Fifth and Main Sts., CINCINNATI, November 28, 1894.

There has been an increased volume of business in Southern Coke Iron during the past week; several round lots, aggregating 12,000 tons, have been sold at about the range of prices indicated in the table. No. 3 Foundry has been especially firm, but No. 2 Foundry being in relatively larger supply has not been so well sustained. In addition to the large consumption of Bessemer Iron already noted, there has been evidence of a larger melting of Coke Iron throughout the country. Up to the present time mills and foundries have carried but light stocks, carrying only enough Iron to meet current requirements, and although they have placed orders with the furnaces through agents, they have not seemed to press delivery. Now, however, there is an urgency to have Iron delivered quickly. For some time past small consumers have found that two to three weeks' notice was ample warning to the furnaces to deliver Iron. Just now, however, the furnaces are being urged from numerous sources to rush shipments, and, there being a scarcity of cars available in the South, many consumers are being disappointed in securing the needed stock to continue using the same mixture, which is resulting in considerable annoyance. There has been a sentiment prevailing that heavy purchases would be deferred until after the first of the year, as there would be no disposition among consumers to increase stocks at this time of the year for obvious reasons. The experience of the past week, however, more especially of the past few days, has demonstrated that this belief was not so very well founded. There has been apparently a general increase, though not large in any special instance, in the melting of Iron by both foundries and mills. The large purchases, however, have been mainly by mills of No. 2 Foundry, No. 1 Soft and Gray Forge. One sale of 5000 tons and four additional sales of 1000 tons each are reported, as well as several lots of 200 to

250 tons each. The 5000-ton lot was sold to a large Eastern mill, 1000 tons of the Southern Iron was sold in the West and 1000 tons Northern Iron to Pittsburgh consumers. While the general market has been firm and hardening there have been instances where quotations on certain grades have been shaded. These facts together with the spasmodic sales give a peculiar character to the market, but it is noted that such irregularities often, if not always, accompany a recuperative movement. Quotations are as follows:

Foundry.

Southern Coke, No. 1.....	\$10.00 @ \$10.25
Southern Coke, No. 2.....	9.25 @ 9.50
Southern Coke, No. 3.....	8.75 @ 9.00
Ohio Soft Stone Coal, No. 1.....	14.50 @ 15.00
Ohio Soft Stone Coal, No. 2.....	14.00 @ 14.50
Lake Superior Coke, No. 1.....	12.00 @ 12.50
Lake Superior Coke, No. 2.....	11.00 @ 11.50
Hanging Rock Charcoal, No. 1.....	16.00 @ 16.50
Hanging Rock Charcoal, No. 2.....	15.50 @ 16.00
Tennessee Charcoal, No. 1.....	13.00 @ 13.50
Tennessee Charcoal, No. 2.....	12.00 @ 12.50
Bessemer.....	11.65 @ 12.00

Car Wheel and Malleable Irons.

Standard Southern Car Wheel.....	15.75 @ 16.75
Lake Superior Car Wheel and Malleable.....	14.25 @ 14.75

Forge.

Gray Forge.....	8.50 @ 8.75
Mottled Coke.....	8.25 @ 8.50

F. H. Miller, formerly of Chamberlain, Turney & Co.; J. J. Wagner, formerly of Rogers, Brown & Co., and Linn Bentley of Madison Furnace, Jackson County, have formed a partnership in Columbus, Ohio, for the purpose of dealing in Pig Iron and Coke.

Pittsburgh.

Office of *The Iron Age*, Hamilton Building, PITTSBURGH, November 27, 1894.

It is not likely that the situation in the Iron and Steel trades will show any material change one way or the other until after the first of the year. The past week has been quiet, and prices on everything are very low, and in some cases seem determined to go still lower. The volume of business is lighter than it was a month or six weeks ago, but a falling off in November and December was expected. There is a very hopeful feeling in the trade as regards volume of business in the coming year. Railroads are expected to be more liberal purchasers, and if this proves true, it will have a good effect on the whole Iron trade.

Pig Iron.—Reports are going of some large sales of Bessemer Pig Iron, for delivery next year, by Valley furnaces. Some of these sales have been closed up within the past week or two, and while the tonnage involved has been considerably less than reported, it is true that some of the Valley furnaces have sold up their entire product to April 1, 1895, and are consequently out of the market as sellers. It is assured that Coke for the first three months of 1895 will not be any higher, two of the Valley furnaces having closed contracts for January, February and March Coke at \$1 ½ ton. Other contracts are in negotiation and will likely be closed in a short time. A prospective Steel concern is reported as looking around for a good sized block of Bessemer for delivery commencing about April 1 next, but have not closed as yet. The demand for Bessemer Iron for December delivery is light, but there is not much pressure on the part of furnaces to sell. It is the general opinion of the furnace operators that Iron will bring better prices before 1895 is very far advanced, and for this reason they are inclined to

some extent, to hold off and pile their Iron. The demand for Gray Forge and Foundry Irons is light and prices on both kinds are weak. Reports are going of sales of Gray Forge at less than \$9.50, Pittsburgh, and No. 1 Foundry has been sold down to \$11, Pittsburgh. We quote as follows:

Neutral Gray Forge.....	\$9.50 @ \$9.65, Cash
All-Ore Mill.....	9.65 @ 9.75 "
No. 1 Foundry.....	11.00 @ 11.25 "
No. 2 Foundry.....	10.60 @ 10.65 "
Bessemer.....	10.40 @ 10.50 "

We note a sale of 200 tons of No. 1 Foundry at \$11.25, Pittsburgh.

Ferromanganese.—Foreign Ferromanganese can be laid down in this market at considerably less than \$48.75, delivered at buyer's mill. The price of domestic is given at \$49, but this would probably be shaded to shut out foreign.

Billets.—The demand is very light and prices are weak. The unsettled condition of the Steel market is claimed to be largely due to brokers offering Steel at prices somewhat lower than the mills will name. A very large quantity of Steel has been sold in the Eastern market, and it is believed much of it was sold "short" and has not yet been covered. The mills continue to ask \$15.50 for Steel for December delivery, but offers to sell as low as \$15.35, Pittsburgh, are being made by brokers. Buyers are sending in offers as low as \$15.10, Pittsburgh, but they are not being accepted. We note a sale of 500 tons for December delivery at \$15.35, Pittsburgh. Transactions during the week have been very light.

Steel Rails.—Reports are being circulated here to-day to the effect that the present Steel Rail pool, which expires on December 31, has been renewed for another year. Prices, however, are reported to be lower, and these rumors put them at \$22 at Eastern mill, and \$23 at Western mill.

Structural Material.—Pittsburgh has captured some good sized orders for Structural work for delivery in New York City, and is also an active bidder for the 35,000 tons of Steel for the Blackwell's Island Bridge. The contract will not be given out for three or four weeks yet. The Schultz Bridge & Iron Company have secured the contract for the new Soho Bridge, the price being \$399,750. A very large tonnage will be required. Considerable other work is coming up and the outlook is very satisfactory. For Eastern competitive business Pittsburgh is making very low prices on Beams. We quote as follows: Beams and Channels up to 15-inch, in round lots, 1.20¢. For medium sized orders 1.25¢ @ 1.30¢ is being obtained. We quote Angles and Universal Plates, 1.10¢ @ 1.20¢; Tees, 1.35¢ @ \$1.40¢.

Plates.—Nothing new developed during the week. Trade is light and for desirable orders very low prices are being made. We quote as follows: Tank Steel, 1.15¢ @ 1.25¢, according to order; Flange, 1.35¢ @ 1.40¢; Shell, 1.30¢ @ 1.35¢.

Merchant Steel.—Considerable improvement in demand is reported and the outlook is much better. A number of agricultural concerns are negotiating for material to cover their requirements for the next three or four months. We quote as follows: Bessemer Machinery, 1.15¢ @ 1.25¢; Open Hearth Spring, 1.50¢ @ 1.60¢; Open Hearth Machinery, 1.40¢ @ 1.50¢; Machine Straightened Tire, 1.40¢ @ 1.50¢; Sleigh Shoe, 1.50¢ @ 1.60¢; Toe Calk, 1.70¢ @ 1.75¢.

Bars.—Considerable improvement is reported in the Bar Iron trade, orders being more plentiful and prices a shade better. Some inquiries involving deliveries up to July 1 of next year are in the market, and orders from Car works are more plentiful. Prices are showing a decidedly firmer tone and we now quote as follows: Common Iron Bars 1¢ @ 1.05¢ and Steel Bars 1.05¢ @ 1.10¢, with the usual extras.

Muck Bars.—We quote nominally at \$18.50, delivered at buyer's mill, for best grades.

Wire Rods.—A considerably better demand is expected for Rods in December, inquiries for some time past being very light. We quote Rods at \$22 at maker's mill.

Sheets.—Mills are more anxious for business and prices are a little lower in consequence. We quote No. 27 Common Iron at 2.15¢ @ 2.20¢, and No. 27 Steel for 2.25¢ @ 2.30¢. Galvanized Sheets are ruling at 80¢ off.

Wire and Cut Nails.—There is a very fair demand for Wire Nails, but the demoralization in prices before referred to continues, and for prompt shipment very low prices are being made. We quote Wire Nails at 90¢ in carload lots for early delivery. There is also a fair demand for Cut Nails, but competition among the mills is very keen and prices are more or less irregular. We quote Cut Nails at 80¢ @ 85¢, according to order. The report that the Laughlin Nail Company, Wheeling, W. Va., would engage in the manufacture of Wire Nails is untrue.

Barb Wire.—The demand is improved and the volume of business is larger, but prices are lower owing to the break in the pool and to active competition. We quote Four-Point Galvanized at \$1.90, Pittsburgh, for close delivery. For round lots for prompt shipment even this low price has been shaded.

Skelp Iron and Steel.—We repeat former quotations as follows: Grooved Steel Skelp, 1¢ @ 1.10¢, according to width and order; Sheared Steel Skelp, 1.15¢ @ 1.20¢; Grooved Iron Skelp, 1.20¢ @ 1.25¢; Sheared Iron Skelp, 1.30¢ @ 1.35¢.

Pipes and Tubes.—The situation is unchanged. There is a fair demand, considering the season of the year, but prices are low, depending largely on the nature of the order.

Connellsville Coke.—Any hopes that the Connellsville Coke operators may have had in the direction of getting higher prices for Coke next year seem to have been given up, for the time being at least. Already several contracts for Coke for the first three months of 1895 have been made with Valley furnaces at the old price. For the week ending November 17 there were 13,936 ovens in the Connellsville region active and 3638 idle, the estimated production for the week in question being 139,207 tons. Compared with the production of the previous week this was an increase of only 18 tons. There is some irregularity in prices of Foundry Coke, and the established price of \$1.15 to consumers is being shaded. Very little Furnace Coke for delivery this year is being sold, but for the first three months of 1895 \$1 per ton is being asked.

Geo. S. Phillips, formerly with Preston & Co., Iron and Steel Factors, Lewis Block, Pittsburgh, Pa., has sev-

ered his connection with that concern and is now identified with Goff & Horner, Iron and Steel Brokers, with headquarters in the above building.

Birmingham.

BIRMINGHAM, ALA., November 28, 1894.

The week shows, in some cases, a slightly better feeling; in other cases the reverse. While the demand is somewhat better, prices indicate no improvement, and stock accumulations continue, though at a much smaller rate than in the last two or three weeks. The strong competition from Northern furnaces is making itself felt in territories usually controlled by Southern Iron, showing the need of Northern producers to place their make wherever they can. The car question is not much relieved. A fair portion of the accumulation of stocks is due to the lack of cars to supply shipments.

Pig Iron.—Sales are fair to numerous, *i. e.*, some reports show average sales, others show a decided improvement in quantities. One sale of 5000 tons No. 3 Foundry and No. 2 Soft is reported at ruling prices, and several sales of 1500 and 1000 tons have been placed. No local transactions of importance are recorded. Sales are well up to make in all cases reported, though mainly for small lots, well distributed as to grades. Sales into next year are fairly numerous, though few are reported beyond April. One concern report 180,000 tons of orders on their books at present. Collections are reported as good. Prices show some uncertainty; a tendency to shade is noticeable in some grades, while the bulk of sales indicate rather more firmness than last week, though no improvement is anywhere noticeable. Stocks show a slight increase all around, owing, in a measure, to scarcity of cars, and are well distributed as to grades. There is no desire shown by buyers to delay or cancel shipments on orders; on the contrary, orders to hurry shipments continue daily. Owing to the very heavy demand for Coke, especially in Mexico, the Tennessee Coal, Iron & Railway Company are preparing to start all their Alice Furnace coke ovens and are making extensive repairs at this plant. They also expect to start Alice Furnace at an early date. Quotations range as follows: No. 1 Foundry, \$8; No. 1 Soft and No. 2 Foundry, \$7 @ \$7.25; No. 3 Foundry, \$6.75; No. 2 Soft, \$6.75 @ \$7; Gray Forge, \$6.25.

Pipe.—The report given by your New York correspondent last week as to the Japanese Pipe order is substantially correct. The Howard Harrison Iron Company, at Bessemer appear to have been the lowest bidders, but when calling for specifications these were so uncertain as to size, quantity tests and freight rates that the matter was dropped for the time being. It is probable that when more definite data are obtained the matter may yet be adjusted and the order filled here. The intention was to ship the pipe via Pensacola, and a fair freight rate had been mentioned, but nothing definite could be obtained, owing to uncertainty of specifications. The ridiculous reports going the rounds of the daily papers have in some cases been taken up by technical papers who should have known better.

The contract for the 100 coke ovens to be built by the Howard Harrison Iron Company, at Bessemer, has been given to J. L. Minar of that place.

Financial.

The financial developments of the week under review have been, as a whole, in the direction of improvement. The announcement made on Monday to the effect that the whole block of the new 5% Government bonds had been awarded to the New York syndicate of financial institutions represented by President Stewart of the United States Trust Company at 117.077, was well received in financial circles. A very important advantage to the Treasury, in accepting the syndicate's bid, is the fact that all the gold in payment for the bonds will be furnished from the outside and none drawn from the Treasury; and it is also more simple and less expensive to the Government to deal with one party rather than with a number of lesser purchasers. It is understood that the whole of the gold for the new issue will be furnished by the national banks in New York, Philadelphia, Boston, Chicago, Cincinnati and San Francisco, and that three New York banks, representing the syndicate, will be the only sellers of the bonds, \$5,000,000 of which are being offered at 119. Four million dollars' worth of these bonds were sold on the first day and it is announced that the price will be advanced to 119½ as soon as the remaining million is disposed of.

Up to Tuesday evening some \$36,000,000 in gold had been received at the New York Sub-Treasury on account of the new bonds, which coin, it is stated, was taken exclusively from the vaults of the banks and trust companies. It is expected that the whole of the \$58,000,000 will be received by the Treasury long before the time allotted to the syndicate for completing its payment. The anticipation of an over-subscription was fully realized, the bids opened on Saturday aggregating \$154,870,900, or more than three times the amount offered. Of this sum, however, \$50,000,000 represents an alternative bid of the Stewart syndicate, so that the actual individual subscriptions were really \$104,870,900. The withdrawals of gold from the Sub-Treasury to pay for bonds, which caused some uneasiness last week, only aggregated some \$4,500,000 after all. Fully \$48,000,000 gold will, it is rumored, be furnished by the New York City banks, leaving only \$10,000,000 to be drawn from the other money centers. The members of the purchasing syndicate expect, it is said, to make a profit of 2 to 2½ on their bonds.

Before receiving any of the bond payments, the Treasury gold reserve stood at \$57,785,000. These receipts will, therefore, about double this reserve. The problem of how to maintain this reserve more or less intact is, however, as urgent as ever, the proportion of the precious metal received from customs and internal revenue being exceedingly small. Henry Clews of New York says there should be no serious difficulty in solving this question. In a recent report he observes as follows: "The supply of gold in the country is many times over what the problem calls for. It is within reach of availability for the purposes of the Treasury; and it is within the power of the banks to make it available sufficiently for the purpose contemplated. The banks could now afford to pay out a considerable amount of gold to importers for customs duties; and if the Treasury would back them in so doing by returning to them as much gold as possible through the Clearing House, the deadlock would be broken and affairs would again run in normal grooves. The present indica-

tions are that matters are tending toward some such simple method of adjustment, and on that account we hope to see an early end to the present de-rangements without much dependence on Congressional bungling."

In Wall street the favorable trend of the markets chronicled last week has been continued with some slight interruptions, and the feeling in monetary and speculative circles appears to be considerably more hopeful and healthful. The satisfactory outcome of the bond issue was discounted on the Stock Exchange early in last week, and the actual event did not, therefore, greatly stir the market, which, however, has assumed a tone of strength and stability during the current week, in spite of unfavorable developments in other quarters.

The reductions made last week in the Burlington quarterly dividend from $1\frac{1}{2}\%$ to $1\frac{1}{4}\%$, and in the half yearly of the Chicago & Northwestern Company from 3% to $2\frac{1}{4}\%$ were not unlooked for, and on the whole exercised a salutary influence as showing that the directors of these roads are following a conservative and prudent course.

Railroad bonds have been somewhat irregular, Erie and Reading issues being specially weak. Government bonds have scored a sharp advance, and are in good demand.

The money market shows symptoms of hardening, and a greater degree of activity is noted in loans than has been the case for months. Small lots of call money have loaned as high as $2\frac{1}{2}\%$, but the quoted rate is still $1\frac{1}{4}\%$, nominally. Time money in the shape of short-time accommodation shows some improvement in the demand, and rates for 30 days have been advanced to $1\frac{1}{2}\%$. For 60 days to four months, $2\frac{1}{2}\%$ is the ruling rate, and $3\frac{1}{4}\%$ for longer periods. Commercial paper is rather quiet. Rates are 3% for 60 to 90 days' indorsements, $3\frac{1}{4}\%$ @ 4% for high-grade single names, $4\frac{1}{4}\%$ and upward for others.

Metal Market.

Pig Tin.—Selling pressure has been even more severe the past week than it was during the preceding one, and prices have undergone a further considerable decline. On Saturday business was done at less than $14\frac{1}{2}\%$, and subsequently at as low as $13\frac{7}{8}\%$, making in all a drop of $0.55\frac{1}{2}\%$ during the period under review. Sales on short account have figured with some prominence, but holders of contracts representing several hundred tons have realized, thus adding more or less to the demoralization. Quite liberal purchases were made by consumers when prices went to and below $14\frac{1}{2}\%$, but this had no perceptible influence as an offset to the speculative pressure here and in the foreign market. At the close there was some improvement, a natural reaction apparently, under which early deliveries went to $13.90\frac{1}{2}\%$ @ $13.95\frac{1}{2}\%$, and later options to $13.85\frac{1}{2}\%$, with sales of April at the latter price.

Copper.—The market has shown somewhat firmer tone and rather more animation, the result chiefly of rumors that the leading producers have at last come to an agreement in the matter of restricting production the coming year. In this market sales of Lake Superior were made at $9.50\frac{1}{2}\%$ and that price was subsequently bid. Boston reports have had it that some 2,000,000 lb were placed at $9.60\frac{1}{2}\%$, but this lacks confirmation, and against it is the stub-

born fact that offers to sell at $9.50\frac{1}{2}\%$ have been made during the past few days by responsible firms. It would appear also that merchants in a position to know state positively that no agreement between producers has been effected, and also that there is no likelihood of any being made. Electrolytic has been sold at $9.30\frac{1}{2}\%$ @ $9.35\frac{1}{2}\%$ in quite liberal quantity, and it seems doubtful that good brands can now be secured at under the last named price. Ordinary casting stock remains at about $9\frac{1}{2}\%$ @ $9.15\frac{1}{2}\%$, but is not selling very freely.

Pig Lead.—Only a very slight movement in prices has taken place, but the market has weakened somewhat in tone, under the influence of freer offering here and extreme indifference on the part of buyers. Foreign has been offering at $3.12\frac{1}{2}\%$ and common domestic would not bring over $3.10\frac{1}{2}\%$ in round lots, although realizing $3.12\frac{1}{2}\%$ in single carloads.

Spelter.—For this article the market has remained positively flat. Purchases are still confined to a carload or two at a time and make a modest showing all told. Prices are rather soft, with $3.35\frac{1}{2}\%$ @ $3.45\frac{1}{2}\%$ about the range for ordinary Western brands.

Antimony.—The market has remained steady at about $7\frac{1}{2}\%$ @ $7\frac{3}{4}\%$ for Hallett's and $8\frac{1}{2}\%$ @ $8\frac{5}{8}\%$ for Cookson's, ex store.

Tin Plate.—Dealings have been on a smaller scale the past week and the market has shown almost uninterrupted dullness. Spot goods and forward deliveries have fared nearly the same. Only slight changes in prices have taken place, but weakness in values is more pronounced nearly all along the line. For spot stock the following prices are quoted: Charcoal Tins: Melyn Grade, one-half X IC, $\$4.75$; IX, $\$6.25$; Lissvane, &c., IC, $\$4.30$; IX, $\$5.12\frac{1}{2}$; Alaway Grade, $\$4.20$; IX, $\$5$; Siemens Steel, IC squares, &c., full weight, $\$4.30$ basis; 100 lb, $\$4.05$ basis. Bessemer Steel, IC squares, &c., full weight, $\$4.25$ basis; 100 lb, $\$4.00$ basis. Coke Tins, IC, 14 x 20: Bessemer Steel, full weight, $\$4.05$; 100 lb, $\$3.67\frac{1}{2}$; 95 lb, $\$3.60$; 90 lb, $\$3.50$. Charcoal Ternes: M. F., IC 14 x 20, $\$6$; IC 20 x 28, $\$12$; Worcester, IC 14 x 20, $\$4.75$; IC 20 x 28, $\$8.60$; Alyn, full weight, IC 14 x 20, $\$4$; IC 20 x 28, $\$8$; Alyn, 100 lb, IC 14 x 20, $\$3.85$; IC 20 x 28, $\$7.60$; Dean, full weight, IC 14 x 20, $\$4.05$; IC 20 x 28, $\$8.10$; 100 lb, IC 14 x 20, $\$3.90$; IC 20 x 28, $\$7.80$; D. R. D. Grade, full weight, IC 14 x 20, $\$3.90$; IC 20 x 28, $\$7.85$; 100 lb, IC 14 x 20, $\$3.80$.

We are indebted to the "Metallgesellschaft" of Frankfurt am Main, Germany, for a copy of the second annual statistical report on Lead, Copper, Spelter and Tin. They make the production of the different metals as follows for the years 1892 and 1893, the unit being the metric ton:

Production of Lead.

	1892.	1893.
Germany.....	98,000	95,000
Spain.....	152,200	154,200
Great Britain.....	44,900	38,200
Austria.....	7,300	6,900
Hungary.....	2,300	*2,300
Italy.....	22,000	19,900
Belgium.....	10,100	11,800
France.....	8,800	*8,000
Greece.....	14,400	*14,800
Other European countries	*2,500	*3,000
United States.....	166,200	151,700
Mexico.....	47,500	84,100
Australia.....	64,000	58,000
Other countries.....	*1,000	*1,000
Total.....	631,200	629,900

*Estimated.

The consumption is figured out as follows:

Consumption of Lead.

	1892.	1893.
Great Britain.....	174,974	181,075
Germany.....	89,595	94,571
France.....	73,545	77,913
Austria-Hungary.....	16,600	15,901
Italy.....	22,787	19,955
Switzerland.....	1,922	1,941
Belgium.....	13,779	14,236
Netherlands.....	*8,000	*8,000
Russia.....	22,100	21,000
Other European countries	2,700	1,500
United States.....	192,623	179,163
All other countries.....	19,800	15,700
Total.....	638,425	630,175

* Estimated.

The last figure seems low to us, since both Australia and China particularly take considerable quantities of Lead.

We need not refer to the Copper statistics, since they are those compiled by Henry Merton & Co., who also collect the figures for Spelter. The distribution of consumption of these two metals is of interest, however. We print the tables below:

Consumption of Copper.

	1892.	1893.
Great Britain.....	77,416	98,398
Germany.....	50,681	54,849
France.....	32,568	36,864
Austria-Hungary.....	9,456	12,588
Italy.....	3,571	4,486
Belgium.....	*4,000	*4,000
Netherlands.....	*2,400	*2,400
Russia.....	13,800	13,800
Other European countries	1,400	2,300
European exports.....	2,000	3,800
United States, without reference to stocks.....	119,628	72,781
Consumption of Japanese Copper in Eastern Asia..	9,883	12,668
Total.....	326,903	319,532
Copper supply according to Merton & Co.....	315,818	308,839

* Estimated.

The consumption of Spelter is figured as follows:

Consumption of Spelter.

	1892.	1893.
Great Britain.....	73,547	75,042
Germany.....	99,672	93,575
France.....	40,783	44,791
Austria-Hungary.....	18,519	22,046
Italy.....	1,575	1,682
Belgium.....	42,600	45,000
Netherlands.....	*3,600	*3,600
Spain.....	3,613	3,514
Russia.....	9,438	9,600
United States.....	73,465	69,058
Other countries.....	*9,500	*13,000
Total.....	376,312	380,888
Production.....	372,900	378,093

* Estimated.

The world's production of Tin is placed at 66,400 metric tons in 1892, against a consumption of 61,600, while the output of 1893 was 69,800 tons, compared with a consumption of 65,800 metric tons.

New York.

Office of *The Iron Age*, 98-102 Reade street, New York, November 28, 1894.

Pig Iron.—The market has been very quiet, with a weakening tendency on the part of some Southern makers. Some effort to develop our export trade lately have been rendered futile by high ocean freights. We quote standard brands \$12.25 @ \$12.50 for No. 1; \$11 @ \$12 for No. 2; \$10.50 @ \$11 for No. 2 Plain, at tidewater. Southern Iron, same delivery, \$11.50 @ \$12 for No. 1; \$10.50 @ \$11.25 for No. 2; \$10.25 @ \$10.75 for No. 3; \$10.50 @ \$10.75 for No. 2 Soft, and \$10.75 @ \$11 for No. 1 Soft. Foundry No. 4 (Foundry Forge) is \$10 @ \$10.40.

Cast Iron Pipe.—The order for Johnstown, N. Y., involving about 1900 tons of Cast Iron Pipe, has been taken by the Utica foundry. One of the larger lettings of the near future is

for 4000 tons of 24-inch Pipe, and about 500 tons of smaller sizes for Washington, D. C. The bids will be opened on December 10. There is nothing new concerning the Tokio order.

Ferromanganese and Spiegeleisen.

—An order for several thousand tons of Ferromanganese for Chicago to cover 1895 requirements has been taken by an American maker at private terms. In spite of low offerings of foreign Spiegeleisen, nothing has been accomplished in this direction. We continue to quote nominally, \$20 @ \$21 for 20% Spiegeleisen and \$47 @ \$49 for foreign Ferromanganese, tidewater.

Billets and Rods.—In sympathy with Western advices the market is easier. We quote \$17.50 @ \$18 for domestic Billets and \$24.50 @ \$25 for Wire Rods, tidewater.

Steel Rails.—The majority of the Rail makers have entered into an arrangement concerning the present pool, and have decided to establish as the price for 1895 delivery for 45-lb Rails and over \$22 East and \$23 West, the tidewater price being \$22.75. It will be observed that it refers to all sections over 45 lb, as compared with 50 lb as formerly. Eastern makers do not report any sales as yet, the new quotations having been out only a few days. We quote Girder Rails 24.

Track Material.—We quote as follows for small lots: Spikes, 1.40¢ @ 1.60¢; Fish Plates, 1.20¢ @ 1.40¢; Track Bolts, Square Nuts, 2¢ @ 2.10¢, and Hexagon Nuts, 2.10¢ @ 2.30¢, delivered.

Manufactured Iron and Steel.—No contracts of any magnitude have been given out during the past week. Evidence is accumulating, however, that the requirements for buildings will be very heavy next year. Among the structures which are to come in the near future is a very large building in Buffalo, and a good sized contract in Rochester. In this city some very large schemes are talked of. In shipbuilding the Norwich Line talks of a new boat, and the Plant system is figuring on a new vessel. It is possible, too, that a new Albany boat, long talked of, may be placed. The New Haven road has placed an order for 25 locomotives and the Pittsburgh Locomotive Works have taken an order for a locomotive for South America. The cars were also placed in this country. The Rail and Steel Sleepers, however, were captured by an East Coast English mill, in spite of a low bid by an American works. Prices continue very low all along the line. Some very low figures have been named on Angles and on Refined Iron. We quote: Beams up to 15-inch, 1.30¢ @ 1.50¢ for round lots; Angles, 1.20¢ @ 1.35¢; Universal Mill Plates, 1.20¢ @ 1.35¢; Tees, 1.40¢ @ 1.60¢; Channels, 1.35¢ @ 1.50¢, on dock. Steel Plates are 1.20¢ @ 1.40¢ for Tank; 1.40¢ @ 1.45¢ for Shell; 1.50¢ @ 1.65¢ for Flange, and 1.75¢ @ 2¢ for Fire Box, and 2¢ @ 2.25¢ for Locomotive Fire Box, on dock; Refined Bars are 1.15¢ @ 1.9¢, on dock, and Common 1.05¢ @ 1.15¢; Soft Steel Bars are 1.10¢ @ 1.30¢; Scrap Axles are quotable at 1.25¢ @ 1.50¢, delivered; Steel Axles, 1.25¢ @ 1.50¢, and Links and Pins, 1.85¢ @ 1.50¢; Steel Hoops, 1.40¢ @ 1.50¢; Best Iron Boiler Rivets, 2.90¢ @ 3¢, delivered; Cotton Ties, 67¢ @ 75¢ @ 45-lb bundle, tidewater; Machinery Steel, 1.20¢ @ 1.40¢; Toe Calk, 1.60¢ @ 1.70¢, and Sleigh Shoe, 1.20¢ @ 1.25¢; Tire, 1.25¢ @ 1.30¢, and Spring, 1.65¢ @ 1.70¢, delivered.

British Metal Market.

[Special Cable Dispatch to The Iron Age.]

LONDON, November 28, 1894.

Another sharp decline in Pig Tin prices has taken place. From the quotations at date of last week's report it amounts to £2. There was a slight rally on Friday last, when £64. 2/6 was paid, owing to more restricted offering and covering of "bear" accounts. Pressure to sell by Eastern merchants and lack of syndicate support combined to weaken the market, while reports that the latter were free sellers the past few days added to the demoralization, and prices receded to £62. 2/6. There has been very little outside speculative buying. To-day's market showed rather more steadiness, but was quieter. Straits quoted at £62. 10/- spot, and £62. 15/- for three months' futures.

Copper has been somewhat firmer, with Merchant Bar prompts up to £40. 5/-. The improvement is attributed to lessened offering and reports that the pending agreement of leading producers to restrict output has been effected. Transactions were large immediately after this announcement, but since then the market has been quieter. Many dealers are doubtful of the issue of producers' negotiations. At the close Merchant Bars were quoted down to £39. 15/- for prompts and £40. 2/6 for three months' futures. Best selected English is about £42. 10/-.

Tin Plate business has been moderate and the inquiry is small. Ordinary Cokes obtainable at 1½ pence less this week than last and prices generally weak. Llanelli makers threaten to close works owing to workmen refusing to concede in wages. This is due to lowness of prices and smallness of contracts. Shipments are smaller and stocks at shipping points have increased to 280,000 boxes. Sellers' quotations at Swansea are as follows:

Bessemer Cokes, 1C 14 x 20..... 9/9 @ ...
Siemens Cokes, 1C 14 x 20..... 10/ @ ...
J. B. Steel Cokes, 1C 14 x 20..... 9/9 @ 10/-
Ternes, 20 x 28

Charcoals, 1C 14 x 20..... 11/ @ 13/-

Pig Lead has been dull and the market is weak at £9. 12/6 @ £9. 15/- for Soft Spanish.

Spelter freely offered, and prices lower. Ordinary Silesian quoted at £14. 10/-.

Pig Iron warrants have fluctuated in a very moderate way only. Late dealings were at 42/6 for Scotch, 35/4¢ for Cleveland and 43/6 for Hematite.

The La Belle Iron Works, Wheeling, W. Va., manufacturers of muck bars and steel cut nails, have decided to engage in the manufacture of tin and terne plate. A force of men has already been put to work tearing down some old puddling furnaces to make room for the new machinery. The contract for the equipment of the plant has been given to the Leechburg Foundry & Machine Company of Pittsburgh, and consists of four hot mills 24 x 32 inches, four 22 x 34 inch cold roll mills, four

36-inch doubling shears, with engines attached, and two 36-inch squaring shears. The new plant is expected to be ready for operations on April 1, 1895, and will have a capacity of about 500 boxes per day.

It is reported that the Spathite Furnace, formerly known as the North Alabama Furnace, at Florence, Ala., will go into blast during the next two weeks.

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HARDWARE.

Condition of Trade.

USUALLY at this advanced stage of the season a marked falling off in the volume of business is expected, but at the present time it is the general report of those in close touch with the market that the demand continues fair, not showing the usual diminution. A great many small orders are being received by the jobbing houses, covering assortments of goods in which winter specialties and holiday articles have a prominent place. The jobbers also are sending in a few orders for immediate shipment to supply their present requirements, and many of them are negotiating for goods for spring delivery. In the matter of prices there is little if any improvement in the general tone of the market. On many goods ruling prices are weak, and within the past few months there has been more or less of a decline in many articles. The condition of the iron market unfortunately does not give indications of an early improvement or furnish a basis for expecting advanced prices and a stronger tone. Owing to this state of things buyers are limiting their purchases to such goods as are sure soon to be taken off their hands in the regular course of business. The fact that on one or two lines advances have been made within a few weeks is referred to as indicating the possibility that buyers who defer placing their orders too long may be obliged to pay higher prices. Recognizing the fact that there may be a reaction from the extremely low prices now ruling, careful merchants are watching the market closely so as to perceive if they can the first indications of a turn. Many of them express the opinion that prices are not likely to go much lower, and consider it a wise policy to purchase conservatively and carefully such goods as their business calls for.

Chicago.

(By Telegraph.)

Shelf Hardware jobbers report another very good week as compared with the record for the preceding part of the year. The aggregate of sales is, of course, very much better than that

of last year at this time. Localities in which farmers were reported to have suffered from crop failure are even doing fairly well in purchases of merchandise. The hand-to-mouth policy pursued among merchants is having the effect of prolonging trade and making it very steady. The demand is of a general character on this account. The full line of shelf Hardware is moving, and seasonable goods are going out in a steady stream. Inquiries are improving for heavy goods, and country merchants are quite generally asking quotations on carloads and half carloads, showing that they are inclined to stock up a little in these lines. The shortage in Tinware continues, although the factories have turned out larger quantities the past six weeks than during any similar period in their history. Heavy Hardware is not quite so active as last week, but the condition of this branch of trade is still fairly good.

St. Louis.

(By Telegraph.)

The demand for Hardware continues in the satisfactory condition noted in our last issue. The end of the year is approaching, and retailers are not disposed to stock up too heavily at this time. A large trade is reported in Galvanized Iron, Tinware and House-furnishing goods. In Barb Wire and Wire Nails the feeling is unsettled, and in view of the near approach of extreme winter weather, retailers are temporarily out of the market, preferring to buy in the spring and take their chances on the market advancing in the mean time. Winter goods are in excellent demand and large numbers of Gas and Oil Stoves are being sold by the jobbing trade. Prices continue unsatisfactory and in some lines are even lower than last reported. The general situation is fairly satisfactory, however, and prices are expected to show some improvement before long. Stocks in both jobbers' and retailers' hands are light, and it only needs a little increase in the demand for certain lines to have some effect on prices.

Notes on Prices.

Wire Nails.—There continues to be a good deal of inquiry for quotations on small lots for comparatively early delivery and larger parcels to cover future requirements. The volume of business also has been very satisfactory and the mills are well occupied on orders and have comparatively small stocks on hand. Notwithstanding this, the manufacturers are competing very actively for

business and prices are low and somewhat irregular. The market is represented in a general way by the quotation of 90 cents for carload lots at mill, but orders have been placed at 85 cents.

Chicago, by Telegraph.—A few good sized contracts are reported by manufacturers, but trade generally has been light. The large buyers appear to have covered their requirements fairly well during the season of water delivery. Inquiries now coming up are chiefly from the interior. Prices are about the same as they have been, hovering around \$1, Chicago, for factory shipments, but Chicago prices are not a safe criterion for outside localities, owing to the low water rates which have governed delivery prices here. Jobbers report a much larger inquiry for mixed cars of Nails and Barb Wire. They quote in a regular way \$1.10 for small lots from stock and are making strong efforts to maintain this price in spite of competition from jobbers in other localities.

Cut Nails.—The Cut Nail market continues in about the same condition as at our last report, with a fair though not heavy volume of business. Where the mills are quoting prices delivered at certain points, it is on a basis of 75 to 80 cents at mill, with a 60-cent average. The quotation of 90 cents, on dock, New York, with a similar average, represents the market, but this price is slightly shaded. Small lots from store in New York are held at \$1 to \$1.05.

Chicago, by Telegraph.—Orders are reported by manufacturers to be of the same character as heretofore. Merchants are only buying what they actually need and are not contracting ahead to any extent, but their orders keep the local factory well employed. Prices are therefore unchanged at 90 cents for 60-cent average, with small lots from stock selling at \$1.

Barb Wire.—There has been little change in the Barb Wire market since our last issue, prices being represented by the quotation of \$1.85 to \$1.90, a figure which, however, has been slightly shaded. There is a good deal of inquiry for lots for future delivery, and a number of orders have been booked. Manufacturers refer to the indications of an exceptionally large business during the coming year. Some of them are disposed to be conservative about naming low prices for future delivery.

Chicago, by Telegraph.—The outlook for Barb and Plain Wire is growing very much brighter, so far as demand

is concerned. Inquiries are being received from a very large part of the Northwest, both for early shipment and future delivery. Every effort is being made by buyers to secure lower prices than manufacturers have thus far quoted. The circular recently sent out from a Pittsburgh house appears to have had the effect of stirring up much of this inquiry, which is now coming in to the standard manufacturers. They refuse to meet the quotations which have been made by their competitors and express the belief that in a short time it will be shown that it is not necessary to make the great concessions asked. Jobbers' prices for small lots from stock are now \$1.75 for Painted and \$2.10 for Galvanized. The movement in Plain Wire and all classes of Market Wire and related goods has been exceedingly active of late and the prospects are very flattering for a very much heavier trade than usual after the close of the year.

Parker Portable Heater. — The Charles Parker Company, Meriden, Conn., and 97 Chambers street, New York, request us to state that the discount to the trade on the Parker Portable Heater is 50 per cent., instead of 50 and 10 per cent. as previously announced.

Bicycle Wrench. — A description of an improved Bicycle Wrench put on the market by Whitman & Barnes Mfg. Company, Akron, Ohio, and 111 Chambers street, New York, was given in our last issue. This Wrench is offered to the trade at \$12 per dozen, subject to a discount of 40 per cent.

Glass Cutter. — The W. & C. Gauge Glass Cutter, described in our last issue as put on the market by Wells & Coutan Company, 29 and 31 Gold street, New York, is sold at \$12 per dozen, subject to a discount of 40 per cent. to the trade.

Oil and Gasoline Can. — The New Idea Oil and Gasoline Can, put on the market by A. F. Chable, 2827 Euclid avenue, Cleveland, Ohio, and described in our issue, 15th inst., is sold to the trade at \$12 per dozen, subject to a discount of 30 per cent.

Hose Band and Mender. — Clayton & Lambert Mfg. Company, Ypsilanti, Mich., are putting on the market the Double Clinch Hose Band and Mender, a description of which appeared in *The Iron Age*, November 15. The goods are sold to the trade from the following list, which is subject to a discount of 25 per cent.:

Menders and Bands.

$\frac{1}{8}$	$\frac{1}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	inch.
\$0.76	.90	1.30	1.60	1.90	per doz. sets.

Menders Only.

$\frac{1}{8}$	$\frac{1}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	inch.
\$0.36	.40	.60	.80	.90	per doz.

Bands Only.

$\frac{1}{8}$	$\frac{1}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	inch.
\$0.40	.50	.70	.80	1.00	per doz.

Grater and Cutter. — Perk's Combination Horseradish Grater and Cutter,

manufactured by Schoeter Brothers, St. Louis, Mo., and illustrated in *The Iron Age*, November 15, is sold at \$42 per dozen, from which a discount of 25 and 5 per cent. is allowed.

Glass. — The American Window Glass market is in a slightly improved condition over that reported last week, in the way of both prices and demand. There is little difference in the printed prices of the various manufacturers, which are nearer to the market price than usual, and manufacturers less inclined to make concessions. There is an equivalent to 1356 pots reported as being in operation, a larger number than were working this time last year. This fact, taken into consideration with the statement that no great amount of Glass is being put into stock, indicates a fair and steady demand. Pittsburgh prices in car lots are reported as being 89 per cent. discount for single and 90 and 5 per cent. discount for double strength Glass. The Plate Glass business is not in a condition satisfactory to the manufacturers, as demand has fallen off considerably, with a not very encouraging outlook for the future.

Compensation of Salesmen.

BY VIATOR.

THIS PROBLEM of deepest import in business is at the present time receiving the attention of business men in all branches of mercantile and industrial pursuits. At a recent meeting it was the subject of a prolonged discussion.

The primary object of a mercantile house in embarking in business is to make money. Goods must be well bought. They must be well sold. The question arises: What basis of compensation will expand the energies of salesmen, not only to sell goods, but to sell them at a profit?

In this period of aggressive competition a salary basis does not meet the exigencies of the occasion, as it constantly creates friction between the employer and employed. Should a salary be agreed upon and the salesman not obtain the results his employer expected from him, his salary would necessarily be reduced at the expiration of the existing contract; and a reduction of salary does not unlock the finer sympathies of a salesman toward his house.

Again, on the other hand, if the salesman meet with a greater success than he anticipated, he will naturally ask for an increase of compensation. In short, frequent readjustments are necessary, and these are often breeders of discontent on both sides.

The profits in the Hardware business are so irregular, many goods being sold at or near their cost, while others will pay fair profits, that a horizontal commission basis cannot be adopted. To pay salesmen nominal salaries and give them a certain per-

centage of the net profits of the concern is not fair, as the salesman who may sell the largest amount of goods at most satisfactory profits would contribute to the income of the less successful salesman.

The disastrous practice or folly of the average salesman to offer "leaders" as "baits" has increased to such an extent that nearly the entire line of Hardware has evolved itself into leaders. One salesman makes leaders of Screws, Shovels, Locks or Skates. The other makes leaders of Nails, Barb Wire, Guns or Cutlery. So the Hardware business is to a good extent reduced down to leaders—an endless amount of detail work, risk, anxiety, without profit—simply glory!

But it is characteristic of the salesman of to-day to possess a desire to be self sustaining and independent. If he is capable of representing a house he knows the customers personally, knows their requirements, knows the scale of prices they are entitled to. He knows the probable time when they will be ready to place their general orders. He is posted on the conditions of the crops and knows where they will promise the largest field. In short, is a better judge of the requirements, conditions and peculiarities of his individual territory than the head of the concern, who has a general supervision of 25 to 50 salesmen.

Place your salesman on a profit basis, he paying his own traveling expenses. In other words, let his compensation be the difference between a fixed price to him and the price obtained. There must be sound judgment in making the basis and the tendency thereof must be to force him by means of an attractive schedule to push profitable goods. To illustrate:

Description of goods.	Your cost.	Fixed price to sales-man.	Your profit.	Price obtained by salesman.	Salesman's profit.
1 keg Nails...	\$1.00	\$1.08	\$0.08	\$1.08	\$0.05
1 dozen Locks...	1.80	1.90	.30	2.15	.25
1 Refrigerator...	28.00	30.00	4.00	36.00	6.00
1 dozen Knives...	5.00	6.00	1.00	8.40	2.00
1 dozen Razors...	11.80	18.90	2.30	17.00	3.10
1 gross Screws...	.43	.45	.02	.47	.02
Totals.....	\$45.63	\$58.28	\$7.65	\$64.70	\$11.42

RECAPITULATION.

Invoice Sam Jones & Co.....	\$64.70
Your profit.....	\$7.65
Salesman's profits.....	11.42
Cost of goods.....	45.63
	\$64.70

The above is also a very simple record of sales.

On general principles compensation creates energy—energy creates compensation.

Citizens of Kokomo, Ind., have raised a fund of \$50,000 to be devoted to cash bonuses for manufacturing concerns locating in their town. In addition, inducements in the shape of free natural gas, free building sites and exemption from taxation for a period of three years are being offered to desirable industries willing to locate at Kokomo.

Passing Forged Checks.

WE ARE INFORMED by John C. Clarke, Chambersburg, Pa., that he has been defrauded by a man who is passing forged checks, whose operations seem to be confined to persons in the Hardware trade with whom he is acquainted. It will be well for the trade to be on the lookout for him. A description with full information may be obtained from Mr. Clarke.

A RECENT ISSUE of one of the Brooklyn daily papers gives prominent place to an interview with George M. Eddy,

well known to the trade throughout the country as a pioneer manufacturer and founder of the Measuring Tape manufacturing concern of George M. Eddy & Co. Mr. Eddy is in his seventy-seventh year, and has been a manufacturer for 50 years. In the interview Mr. Eddy narrates some of his very early experiences, and refers in an interesting way to the New York and Brooklyn of a half century ago and the Hardware business and concerns of that period. Mr. Eddy has amassed a considerable fortune, and notwithstanding his years is still vigorous and active and visits his works daily, besides giving due attention to real estate matters in which he is interested.

we must ourselves be friendly," which is but the practice of the golden rule.

Kindly Competition.

I have also learned that business can be conducted actively and yet peaceably, for while not professing to be better than others, I can make the assertion with satisfaction that in the 50 years I have never had a quarrel with any of my fellow merchants, and I expect to continue the same peaceful course to the end.

Doing Right.

I have learned that straightforward dealings beget confidence, and that it is not only a good principle, but good policy, and that it pays in the long run to do right, and it certainly is a satisfaction to me, at this time, when I know that my active life will soon end, to look back on the experience of the past with so few regrets as to the business principles that have governed me.

I do not wish you to infer from my remarks that any of you need a lecture as to how to manage your affairs, or that you have not used your time as profitably but I have been asked to tell what I have learned, and I have told you.

Let us all so conduct our affairs that when the great balance sheet of eternity is displayed, and all our earthly losses and profits have been counted up thereon, it may show for each one of us that in gaining what we have of this life's riches, we have not fouled our hands or our souls by anything that in that day may cause us shame.

A Hardwareman Abroad.

An interesting paper on this subject was presented by William C. Peters of J. M. Vance & Co., Philadelphia. In it he gave the impressions made upon him by what he saw of the trade in England and on the Continent, alluding to some lessons that might advantageously be learned by American merchants and manufacturers. In opening he referred to the Hardware Club of New York in the following graceful terms :

The president and many of the members made me feel at home among my brethren in the trade. The cordiality and good cheer, the elegantly and costly fitted rooms, the sumptuous repast with pleasant converse, gave me delightful memories to carry across the Atlantic. What they have done is an example to us to make more of our association, to have rooms to which we can repair at our convenience to the midday lunch, with a reasonable expectation of meeting our fellow merchants and manufacturers, to exchange greetings and interchange thought.

Entering upon the account of his trip and the lessons to be learned from it Mr. Peters continued :

I found the Atlantic broad and disposed to make his transient customers pay promptly; but, having for years been in the habit of considering ten days as prompt pay, I eluded the settlement by getting off at Southampton on the seventh day.

It is not my task to give you a detailed account of my sight seeing, which would require more than the time given; but to speak to the subject assigned me, and, if possible, say something for your advantage.

Benefits of Travel.

My first remark starts with the benefit I received from my travels :

Having been in the Hardware business as boy and man, employee and

Hardware Merchants and Manufacturers' Association.

In our last issue we made a brief reference to the meeting of the Hardware Merchants and Manufacturers' Association of Philadelphia, reserving to this week a fuller report. The papers given will be read with interest by the trade.

WE GIVE BELOW the admirable address of William H. Allen, in which the fruits of his observations and experience during the long period of his connection with the trade are embodied. It was listened to with the closest attention and with an appreciation of the wise and kindly spirit which pervades it.

Fifty Years a Hardwareman.

I have learned that this association is a most excellent body of men and that the meetings, by bringing us stately together, enable us to know each other more favorably than we otherwise would. We all have enough self-esteem to think that if others only knew us better they would have a higher opinion of us. Our meetings give us this opportunity, and the result has been a more kindly feeling toward each other because of this intercourse. We discover the good in our neighbor and value him accordingly.

Many people hold the opinion that our education is completed during our school years, when we are wrestling with the three R's and more advanced studies. But a short experience with the stern realities of everyday life, and the oft repeated failure to accomplish that which, before attempting, seemed so easy, soon convinces the young business man that of all his school studies there is a very small proportion that is of much use to him in the conduct of his business. His real education in practical methods then begins, and this experience differs with each aspirant for a living and a fortune. And he often learns more by his failures and his inability to successfully mature his well laid plans than in any other way (that is, if he has the good judgment to use his failures to this end).

I have been asked to tell the members of this assemblage some of the lessons I have learned during my 50 years of active work in my own particular business. The time allotted will allow me to mention only a few of them. I have been styled the patriarch of the Hardware business in Philadelphia. If we count actual years of life I must deline the title in favor of my venerable friend C. M. G.; but if years of business as a Hardware merchant are concerned, I am the elder in that particular, having completed my fifty-first year.

Drummers.

One thing I have learned, and that is, there is more than one course to be pursued in conducting business, and one may be as good as another. The almost universal procedure has been and still is to employ smart and active drummers to endeavor to persuade a neighbor's customers to give their patronage to the drummer's house, making a decidedly interesting, if not a profitable, scramble for trade, and as all the other houses employ the same piratical methods a regular grab game is the result.

I have found from practice and experience that there is another, if not as good and as quick to get rich plan, yet one that has given me more certain control of my business, and that is to use my own customers as drummers for the extension of my business, and it has succeeded admirably. I don't pay them as much as any of you do your drummers, and their work is more lasting. Many come to stay. For example, one of our country merchants, dealing with us for over 40 years and living within 12 miles of Philadelphia, has never received a visit from any one in our employ, and yet he comes. Another one of fully the same term of continuous dealing with us rebelled and threatened that if his visits were not returned he might discontinue them, but he was appeased by one of our firm going out to dine with him, and he still remains faithful.

Employees.

I have learned that it is of just as much importance that the employer should have good, reliable, faithful employees, as for them to have good situations, and that fair treatment of them pays in the end and that we can attach them to us thereby, for out of 20 employees we have 7 whose combined service amounts to 140 years, fully one third of the number averaging 20 years each.

Friends.

Having passed through all the financial panics of the past fifty years, and they have been many and trying, I have learned by experience the real value of tried and true friends to stand by me, but have also learned that such friends must in most cases have been earned as friends by the doing for them of friendly acts, of assistance and advice in their times of need. It is a truth "that if we would have friends

employer for about 45 years, from May 21, 1849, when I was made happy in obtaining a situation with Messrs. Dilworth, Branson & Co., at the store Market street, below Second, at the salary of \$4 per month for the first year, and continuing therein, with the exception of a few months, until the present time, I felt brain weary, and, needing more rest than the usual vacation of two weeks would give, I availed myself of an opportunity to take a three months' tour through England and Continental Europe.

I have not been disappointed, for the trip has proved to be a positive contribution to my health and nervous energy, and although it cannot restore youth, yet if it shall enable me to continue in business a few years more my hope is that it will be a benefit, not only to myself, but to others also; not only to our own business, but also to yours, for thus it should be—the continued life and growth of one's own business should not be an injury, but a benefit to one's fellows, and so methinks will be, if conducted in a proper and manly spirit.

If then the trip and rest have done me good, let it be an example and incentive to you that if in the future your body and mind need rest, do not be as a galley slave chained to your oars, rowing until you break down and die, but take the recreation your health demands, for "the life is more than meat and the body than raiment," and if the travel and rest is really a recreation it will in the end be also of financial value. A man generally goes abroad with a definite object, and mine was not to glean something of advantage to our business, but rather to be lifted out of the deep grooved ruts of our usual daily thinking by diversion into other channels.

Philadelphia Hardware Interests.

Why go to England and the Continent for hints and helps to a Philadelphia Hardwareman?

Some say that we are slow and conservative in this our Quaker City; which we cannot allow unless careful management is slowness and the intent and planning to meet one's honest engagements is conservatism.

If we need examples of more progressive Hardware energy, methinks it would be better to travel to the newer West, rather than to the older East, for it seems that the further east we go the older, slower and more rutted is our calling, and in Europe Hardware jobbing houses as good as we have in Philadelphia are exceedingly scarce.

We found one house in Munich about as large as ours, but in order to make it there was a combination of Foundry Castings, Stoves, Plumbers' Supplies, Saddlery, Housekeepers' and Building Hardware, Cutlery and Tools, and having the connection of a manufactory situated elsewhere.

This fact of the combination of store and factory brings up the question:

Is it best to have a firm to be both

Manufacturers and Jobbers?

To which our past experience has taught us the negative, for a jobber should be able to deal to advantage with competing makers, to enable him to serve his customers at the lowest rates with any goods his trade may demand; and makers of rival or similar goods of those you are makers of are generally found to be too jealous of their lowest and special rates to give them to you for fear that such information will enable your manufacturing department to meet or undersell them with their other customers in similar articles.

Arrangement of Stores.

The next question, Did we find the stocks and arrangement of foreign stores better than our own?

The goods they offer, with the exception of a few American tools and such goods as we now import, are such Hardware and tools that we imported 30 to 50 years since; many of which have been pushed aside by the superiority, finish or cheapness of our American makes. It did not seem to be worth the time and trouble to make any special arrangements, especially with foreign German manufacturers, considering the fact that the agents of those concerns who make for the American market do their work thoroughly in bringing promptly to our notice the samples and prices of goods suitable for our needs; and the different and detailed system there prevalent would add much to the difficulty of doing it successfully.

Turning from the jobbers, permit me to say a word concerning manufacturers.

Foreign Trade.

The American manufacturers should aim to obtain a larger share of the trade of the world.

Something should be done to help to carry off the excessive production, which has so often proved destructive in the consequent rivalry to so many worthy and energetic firms. The needs of our country in proportion to our population are greater than those of any other nation, which needs are the natural result of the higher rates of wages paid to skilled labor, enabling them to buy of conveniences and luxuries which they will not be able to do when only given sufficient remuneration to furnish the bare necessities of living. These great needs in the past, and the high price of labor, have been great incentives to our wonderful inventive genius in constructing labor saving devices, helping much to place us in the front rank of the industrial nations.

Our greatest competitors in the great struggle to supply the growing needs of the world during the coming century are Great Britain and Germany.

Great Britain, with her great fleets ploughing all seas, her dependent colonies, her long experience and her well arranged systems, occupies the front rank. There is, however, in our line a close adhering to old styles and methods which in years past excelled all others; and so, with this prevalent disposition to leave well enough alone, may be hindered in the race when new conditions demand new methods.

Germany, in her exports of Cutlery especially, has changed and improved much from our early days, when it was only the cheap and common kinds to be found upon our shelves, and it was a usual saying that "it was Dutch all over." An improvement and adaptation are now manifest—copying the best styles of popular English makers, using excellent material, and with their cheaper skilled labor placing increasing quantities of their best products among us. This will serve as an illustration of what they may be doing or able to do in other lines.

Then, I have been informed, they are introducing more labor saving machinery, perhaps learning of and taking of our own. The prices paid for skilled labor are lower than in Great Britain or our own land. If we will consider these facts, and that the nation who will take and hold the first rank needs either the cheapest labor or the best labor saving machinery, then we can judge that Germany will be a growing and formidable competitor for the great prize we should strive for.

Military Training.

There is another thought about Germany which I will mention. We have often thought of the great standing army of Germany as a detriment and injury.

While from some reasons this is true, yet there is an opposite thought—to wit, that the unusual thorough training of the young men in their strict army regulations is a grand help in making them effective. The raw recruit is taken from home, from farm, village or city, and taught to obey—to keep his whole body in perfect order, to be ready for any emergency. This, with his earlier school training and education, fits him not only to be a good soldier, but to be thorough and effective in his later mechanical and business life. Therefore, Germany enters into the struggle of the battlefield, or of trade, a nation of well-trained men.

Wages.

The American manufacturer needs the outlet of foreign markets to assist in getting rid of his excessive production. If, however, to accomplish this he must cheapen his labor and reduce the wages of his workmen to the low rates paid in England and Germany—permit me to further remark that such a course is not advisable, for in proportion to said reduction would be the reduction of our home market.

If, as was mentioned, that our needs, greater than those of any other people, are the natural result of high wages, so the reduction of these wages would be a necessary and sufficient cause of lessening the demand for goods and consequently the reduction of our home business. There is, however, another and more lasting way of obtaining and holding trade than that of cheapness. It is the way of a

Superior Excellence.

By this way several of our Philadelphia makers of Hardware have already entered and hold their own in foreign markets. As Disston's Saws are known and sought for over the civilized world, and as this wide world market has grown from the thought expressed years ago by Henry Disston that "his aim was to make the best Saw in the world," followed by years of practical energy in making this thought a fact; so many others follow and succeed; so have already several of our Philadelphia makers entered into the markets, home and foreign, of our great competitors of Europe. There is Asbury with his machines, Harper with his Hoes and Rakes, Myers and Evin with their Forks, and Philadelphia and Pennsylvania Lawn Mower makers have made the name of our city and State familiar names in Great Britain and Continental Europe.

Shipping Interests.

Another but much to be regretted fact we noticed in the ports of Europe was the absence of our flag. Previous to the Rebellion, I think, we held the second place in the commercial marine of the nations.

The sympathy and aid of Great Britain to the privateering ships of the seceding States injured our commerce materially, but not so much as the injurious passage and continuance of our navigation laws, without supplementing provisions to foster our foreign commercial marine. President Cleveland called attention to this in his address last week at the launching of the ship "St. Louis."

The navigation laws do not protect or aid our foreign commerce as perhaps they were intended to do—for it is a fact that the open competition for this trade will result to the benefit and

growth of those who can build and run their vessels the cheapest, and has resulted in the almost disappearing of our flag in foreign ports. The annulling of these laws would tend to the increase of vessels sailing under our flag, and of the retention of many millions of freight money to the American merchant, but would not result in the fostering of our American shipbuilding interests, for millions of money would go abroad to build or buy ships, and thus aid their shipbuilding interests, and scatter our money among the mechanics and laborers of Europe.

The question then remains for our Congress :

What Shall We Do?

We are sent to Washington, not to legislate for the interests of foreign nations, not to receive applause at foreign banquets, but primarily for that which shall be beneficial to our own people. President Lincoln, in replying to the question, Which is better, to buy steel at home or abroad? said, with his usual good sense : "If we take our money and purchase the steel abroad we have the steel but not the money; but if we buy it at home we have both the steel and the money."

As our tariff laws are or should be arranged, directly or indirectly, to benefit and foster our home industries, so these laws should be supplemented by some provisions to foster our shipbuilding interests and furnish employment at home; and thus, by aiding the building of our plants and shipyards, we will fill our own and foreign ports with American built ships, sailing under the Stars and Stripes, and make our nation to be better known and more respected abroad. Great Britain has for many years fostered by bounties or postal advantages her ocean marine, and stands first among the nations, furnishing channels of trade to her merchants and manufacturers, and growing rich thereon. Our boards of trade and commercial bodies should take up this subject and urge upon Congress the great national advantages which will follow proper legislation. Perhaps a system of bounty in proportion to the tonnage for the building and running of ocean vessels, sufficient to equalize the higher wages paid here over those paid abroad, will prove a sufficient incentive for our merchants and builders to build our ships at home.

I have refrained from talking about my travels. The detail would tire you, and it is too familiar, for so many have written their experiences—of the great ocean's vastness and demands, of the rides through Merrie England's midland counties, her wayside inns, the old, but still grand cathedrals, of bustling, busy London—the world's financial heart; of gay, feverish Paris, art-loving and pleasure seeking, with its Louvre and many other galleries of art; of Versailles, where can be read in her palaces and grounds the story of the many years of extravagance and heavy taxation which caused and culminated in the horrors of the French Revolution; of busy Belgium, where English gold is woven with Belgic brains and muscle; of gallant Holland, whose bravery, never yielding, won the land from the sea and drove from it the Spaniards, and who taught the world through her famous William true civil and religious liberty; of the swift and beautiful river, the Rhine, whirling its waters around the base of vine clad hills, and of craggy rocks, surmounted by ruins of old castles, whose baron lords laid tribute on the passing vessels and taught the gain of tariff law; of Switzerland the grand, its charming lakes and valleys, its snow-capped

mountains and ancient glaciers, a frozen tumult is Switzerland; when volcanic billows rolled high, in the midst of their surging, rolling mountain high, the Master said, "Hold! Stand still! and show the coming generations my omnipotence;" of Italy, with its past historic greatness and present decadence, Milan showing a renewed vitality, but Venice and Verona like garrulous old men in their dotage, speaking of youthful glories and follies; of the magnificent Tyrolean Alps, which we passed through on our way from Italy to Munich and to Dresden, in both of which cities are treasures of fine art; of Berlin, whose growth since the consolidation of the German Empire has exceeded the rapid growth of our own city and of New York; of Hamburg, which has also grown proportionately, with its lively Bourse and extensive commerce. There is the good ship waiting to speed us back to our dear native land, which we have learned to appreciate not less, but more, in our three months' sojourn abroad.

Fernley's Spartacus.

The following forcible parody on "Spartacus to the Gladiators" was presented by T. James Fernley :

Ye call me chief; and ye do well to call him chief who, for seventeen years, has met upon the arena of commerce every shape of beast and man the Hardware trade of Philadelphia could furnish, and who never yet lowered his high standard of doing business.

If there be one among you who can say that ever, in public competition or private deal, my actions did belie my tongue, let him stand forth and say it. If there be three in all your company dare face me in the mart of trade let them come on. And yet I was always thus—and never a butcher of prices nor malignant competitor who would rather steal a customer than attend a meeting of the Hardware Merchants and Manufacturers' Association.

My ancestors came from old Sparta and settled among the lovely hills and verdant valleys of Pennsylvania. My early life ran quiet as the brooks by which I sported, and when at noon I gathered the sheep beneath the shade and played with Paul Griffith on his banjo, we were joined by many friends in the pastime.

We led our flocks in the same pasture and partook together our rustic meal.

One evening, after the sheep were folded and we were all seated beneath the myrtle which shaded our cottage, my grandsire, an old man, was telling of Wm. Allen, Charles Ghriskey and William Peters, who in years gone by had made a fortune in that Quaker town by importing Tools, Guns, Locks, Blunt Screws, Candle Snuffers and Tomahawks from across the sea and trading them to Indians in their midst.

I did not then know what commerce was, but my cheeks burned, I knew not why, and I clasped the knees of that venerable man until my mother, parting the hair from off my forehead, kissed my throbbing temples and bade me go to rest and think no more of those old tales of savage trading.

That very night my fortune was mapped out. The next day I embarked in trade, assured that the before mentioned Ghriskey and Peters were specimens of the competitors I would have.

It was not long before the Romans came in sight. I saw the profits that had nourished me trampled by the hoofs of the war horses—Ritter, Bonbright, Griffith and the rest—the blazing embers of my business they threatened to throw to the winds.

Then waged the battle hot—one competitor I killed in the arena and when I broke his helmet clasps, behold, he was my friend! He knew me—smiled

faintly—gasped and died—the same sweet smile upon his lips that I had marked when—in adventurous boyhood—we scaled the lofty cliff to pluck the first ripe grapes and bear them home in childish triumph. I told the pretor that the man had been my friend, generous and brave, and I begged that I might bear away the body, to burn it on the funeral pile, and mourn over its ashes.

Ay, upon my knees, amid the dust and blood of the arena, I begged that poor boon while all the assembled manufacturers and manufacturers' representatives and the holy order called "syndicate buyers" and the rabble of broken competitors shouted in derision, deeming it rare sport, foreshooth, to see Rome's fiercest gladiator turn pale and tremble at sight of that piece of bleeding clay.

And the pretor drew back as if I were pollution, and sternly said, "Let the carrion rot; there are no noblemen but Hardwaremen." And so, fellow competitors, must you, so must I, die like dogs.

Oh, Hardware! Oh, Hardware! thou hast been profitable to me. Ay, thou hast given to that poor, gentle, timid shepherd lad, who never knew a harsher tone than that of a flute note, muscles of iron and a heart of clay; taught him to drive a bargain with as shrewd a manufacturer as Foot, Disston or McCaffrey, and to meet as keen a competitor as Seltzer, Supplee or Rogers, and to gaze into their glaring eyeballs even as a boy would glare at a pretty laughing girl. And I will pay thee back, until the yellow Tiber is red as frothing wine, and in its deepest ooze thy life blood lies curdled.

Ye sit here now like giants as ye are. The strength of brass is in your toughened consciences, but to-morrow some unholy competitor, breathing sweet perfume from his curly locks, shall with his oily tongue an order surreptitiously obtain, foreshooth an extra 5 he'll give or perhaps from case and cartage he'll abstain, or may a salesman steel away or by his lie a manufacturer pollute. Hark! hear ye yon lion roaring in his den? 'Tis three days since he tasted flesh; but to-morrow he shall break his fast upon you, and a dainty meal for him ye will be.

If ye are beasts, then stand like fat oxen, waiting for the butcher knife. If ye are men follow me.

Is business dead? Is the old Peters spirit frozen in your veins that you do crouch and cower like a belabored hound beneath his master's lash? Oh, comrades, competitors, conspirators! if we must fight, if we must slaughter, let us slaughter our oppressors, the manufacturers.

If we must die, let it be under the clear sky, by the bright waters, in noble, honorable competition.

Syndicate Buying.

The question of syndicate buying as to whether or not it is beneficial to the jobbers was the principal subject for discussion, and the debate was interesting, bringing out most of the arguments for and against the system. In addition to the arguments of Messrs. McCaffrey, Ritter and Foot, to which we referred in our last issue, an interesting and forcible address was made by James S. Bonbright. While no definite decision was reached as to what should be done in the matter, the subject is evidently regarded as one of much importance to the trade.

BISELL CARPET SWEEPER COMPANY,
103 Chambers street, New York, and
Grand Rapids, Mich., have brought

out a line of Sweepers, named Wolverine, The Century, Monarch and The Beacon, to meet the competition of broom action Sweepers, which are regarded by them as infringing their patents—a question which will proba-

bly soon be decided. Two of the above Sweepers have japanned trimmings and two are nickelated. The Wolverine has two independent pressure bars with wire guards on the ends to prevent scratching the Sweeper.

Bicycles for 1895.

In the following columns we give further information in regard to prices and patterns of wheels which will be put on the market by manufacturers during the coming season, with special reference to the Hardware trade, through whom Bicycles will evidently be marketed to a much larger extent than ever before.

INTERNATIONAL INTEREST in cycling circles is this week centered upon the contests of Bicycle riders being held at Madison Square Garden, New York, where a large number of both home and foreign riders will compete for honors. Over 180 men are expected to take part, and the entries, which will be kept open from day to day, will probably reach 1000.

The interest taken in Bicycle winter riding of this kind naturally directs attention to the fact that each year wheels are becoming less and less season goods with Hardware dealers, as riders are using their machines out of doors during the pleasant days of winter and spring, especially where the roads are good. Riders who have become accustomed to the exercise of riding during the summer and fall feel the need of it through the winter and spring months, and receive, when properly clothed, much benefit from a run in the crisp air. This is a point which merchants should not lose sight of as an argument in disposing of the balance of the 1894 stock of wheels, and it will possibly aid in making 1895 Bicycles popular as Christmas purchases. There is a great advantage in getting wheels out early among riders.

OVERMAN WHEEL COMPANY.—The Overman Wheel Company, Chicopee, Mass., in a circular letter, after stating that their product for the coming season will be an improvement over that of 1894, remark as follows:

In the Victor for '95 will be recognized a higher standard of Bicycle construction in the line of select material, simplicity of construction, refined methods and mechanical skill. For 1895 we shall make Victors of five different heights of frame, and Victorias of two heights, thus practically furnishing Bicycles to order and enabling riders of all sizes, both tall and short, to be equipped with mounts that exactly fit. Prominent among the improvements will be our new '95 crank hanger, with its hollow axle and narrow tread. This improvement has received not only the indorsement, but the admiration of every agent who has had an opportunity to examine it. For simplicity and strength it is a great advance in Bicycle construction. The crank pin of other years has been abandoned, and in its stead there has been substituted a construction remarkable for its simplicity and easy adjustment. This new combination produces a narrower tread and is both lighter and stronger than our old construction. In '95, for the purpose of giving riders

exactly what they want, we shall furnish them, as an option, with a single tube tire of our own manufacture and design, made with especial reference to strength, resilience and lightness. As heretofore, all parts of Victors, from tire to saddle, will be made in our own factory. We shall not manufacture any medium grade or cheap wheels. Our only product will be the highest grade Bicycle that we can possibly construct with all our experience, knowledge and facilities. The characteristics of our '95 wheel are perhaps more striking, more distinct, and yet more harmonious as a whole than any former model, and combine in a remarkable degree beauty, strength and lightness. The price of Victor Bicycles for '95 will be \$100. Each machine will be furnished with leather tool bag containing Victor Wrench, Pump, and complete repair kit; also a small oiler in a separate leather bag. Brakes, coasters and mud guards will only be furnished when ordered, and at prices for which they are sold as parts.

NATIONAL SEWING MACHINE COMPANY.—The National Sewing Machine Company, Belvidere, Ill., have been considering the advisability of entering the Bicycle field for some years, but have felt it policy to wait until the Bicycle had practically gone through its evolution and settled down to something standard. They now believe that the changes in the future will be very insignificant, as weights, in their opinion, are as light as they can be consistently made; frames as high as riders can reach, &c. The company advise us as follows regarding their line of wheels, weights and prices:

Our product this year will be between 10,000 and 12,000 wheels, of which about 50 per cent. have already been contracted for. Our Bicycles will be constructed of the very best materials throughout and nothing lower than high grade will be made. The following is a list of our different styles, to which will probably be added, before the season opens, a tandem: Franklin, \$125, weight 23 to 25 pounds; Franklin Special, \$125, weight 21 to 23 pounds; Franklin Racer, \$125, weight 17 to 19 pounds; Lady Franklin (Ladies'), \$125, weight 22 to 24 pounds; Eldredge, \$125, weight 20 pounds; Eldredge Racer, \$125, weight 16 to 18 pounds; American Beauty (Ladies'), \$110, weight 25 to 27 pounds; Belvidere, \$100, weight 24 to 27 pounds; Franklin Junior (24-inch wheels), \$80, weight 19 pounds; it has 24-inch wheels and the portions of the frame and other parts are as 24 is to 28. The hubs, cranks, balls, &c., are small and light and just what they should be for a high toned little wheel. We do not expect any great demand for the Franklin Junior, but propose to make it to supply to such parties as want something extra fine for children's use.

THE FOX MACHINE COMPANY.—The Fox Machine Company, Grand Rapids, Mich., who will build their first Bicycles this year, advise us regarding their plans as follows:

We shall devote one floor of our factory exclusively to manufacturing Bicycles and shall turn out a strictly high grade wheel. The weight will be about 25 pounds. What we are going to do is to build the best road wheel made. We do not take any stock in the racing business, but believe that the manufacturer who turns out the best wheel for regular road service will get a good price for it, and this is what we are after.

THE STEAM GAUGE & LANTERN COMPANY, Syracuse, N. Y., and Chicago, Ill., are offering their Cyclone Bicycle Lamp, which is referred to as light, strong and convenient. The lamp is 5 inches high, weighing 11 ounces, and is furnished in the best black japan. The Company state that the reservoir is easily removed, that the lenses are double convexed, highly polished, and that the spring is adjusted so that the light will not jar out on the roughest road.

JOHN PRITZLAFF HARDWARE COMPANY, Milwaukee, Wis., have made arrangements to handle the full line of Featherstone Bicycles for the coming season. The 1895 wheel, it is stated, is greatly improved and strictly up to date in every detail. The line will include the Road King and Road Queen, strictly high grade machines. Also the Duke, Duchess, Prince, Princess and Middy, which will be handled as a high grade medium line.

DEMOREST MFG. COMPANY.—The Demorest Mfg. Company, Williamsport, Pa., will have for the coming season a '95 model, furnished with wood or steel rims, weighing from 24 to 27 pounds, according to the rims used; with a 43-wheel base and a 5½-inch tread, fitted with M. & W. or P. tire. The machine is recommended by the manufacturers as a hill climber. They will also have a '95 racer, with racing or road tires, weighing 20 to 22 pounds, narrow tread and geared as required. This wheel is guaranteed for road use.

W. S. FRAZIER & Co., Aurora, Ill., who are already engaged in manufacturing Road Carts, Track Sulkies, &c., are just beginning the manufacture of Bicycles, and write regarding their plans as follows:

We shall probably manufacture but one style the first season and that will be a machine weighing 20 pounds and of the highest possible grade. As we have sufficient work to occupy the management in our other and regular line of business, we do not intend to make a great effort to manufacture a large quantity of machines, but will rather be content with selling as many as we can easily and conveniently manufacture and market, being extremely careful that each machine produced is of the highest type and entirely free from imperfections.

THE GENEVA CYCLE COMPANY Geneva, Ohio, who have been recently incorporated, after stating that their goods will be strictly high grade machines, continue as follows:

We shall manufacture two models, A and B, and a ladies' wheel of each model. Our A model will be in every respect a wheel equal to any wheel upon the American market, both as to efficiency of workmanship, quality of material and excellency of finish, and strictly up to date in every particular. Its weight will average about 22 pounds. Model B will be a wheel constructed of the same grade of material with the same excellency of finish and perfection in workmanship, but will be heavier, its weight averaging from 26 to 28 pounds. We are confident that we have the facilities, capacity and skill for putting out a wheel which will not only do credit to us as manufacturers, but will be, we believe, a credit to and a favorite with the Cycling trade in general.

THE ROYAL CYCLE WORKS, Marshall, Mich., will have for the coming season three high grade wheels—the Royal Limited, weighing 24 pounds, which is strictly a road wheel; the Royal Red Head, weighing 20 pounds, which will be a light wheel, and the ladies' Royal, weighing 24 pounds.

F. F. IDE MFG. COMPANY, Peoria, Ill., manufacturers of High Art Bicycles, send us the following advices regarding their line of wheels.

We contemplate building for '95 trade our racer and road racer, the Ide Special, the Lady's Ide Special, also the Lady Ide. Besides these we shall place a machine on the market to compete with other standard makes to list at from \$100 to \$110.

THE COLTON CYCLE COMPANY, Toledo, Ohio, have been incorporated, with officers as follows: Chas. Kaufman, president; Geo. B. Colton, vice-president, and F. G. Jaquet, secretary and treasurer. The factory of the new company is 100 by 100 feet, two stories high, and is equipped with the latest improved machinery, with a capacity, we are advised, of 200 wheels per week. The company have just started manufacturing with 100 men, with an output per week of 150 strictly high grade wheels, weighing from 22½ to 26½ pounds. They advise us that they have 4000 machines contracted for and expect to make from 5000 to 5500.

ELKHART CYCLE COMPANY, Elkhart, Ind., who have recently put their plant in operation, advise us as follows regarding their output for the coming season:

We shall be in the market for the season of '95 with a high grade Bicycle in two weights, 23 and 26 pounds, both listing at \$100. The machine is thoroughly high grade and up to date in appearance and in construction, and nothing but the very best of material will be used in making it. We do not expect to sell to the local dealer this year unless he will buy at least 50 machines. We do not care to sell in smaller quantities. We will build wheels and put on such name as the purchaser may desire, provided he takes a sufficient quantity. We have already sold 1000 wheels and have a capacity for building 1000 more.

ELMORE MFG. COMPANY, formerly of Elmore, Ohio, have removed to Clyde, Ohio, where they have purchased a commodious factory. They have been led to take this step because the popularity and increasing demand

for their Elmore Cycles compels them to enlarge their factory and increase their output. They have also felt the need of better shipping facilities, both of which they have secured at their new location.

RICH & SAGER COMPANY, Rochester, N. Y., manufacturers of Saddles for Bicycles, refer to prices and goods for 1895 as follows:

The price upon these goods is and has been lower, we think, than upon any other parts which go to make up a wheel. We are, therefore, not making reduction in our prices for 1895. We do not go into cheap goods at all, making only one class and that the best. Our experience has been that manufacturers of all high grade wheels are willing to pay a little better price for the best Saddles.

For 1895 we have some new features which we think will be appreciated by the trade. The direct post, which was so popular in 1894, has been improved so that by reversing the spring a forward or back adjustment of at least 1½ inches can be given. Our new soft pommel is also a special feature. The pneumatic pads which we are placing on the market are something entirely new. We put the air where the rider wants it and this makes a very satisfactory feature.

RÓGER B. McMULLEN & Co. of Chicago, manufacturers' agents for the sale of Bicycle supplies, have just issued a circular to the trade announcing the beginning of their second year's business. The circular recounts the events of the year, among which is the opening in August of a branch office at 309 Broadway, New York, under the management of J. B. McMullen, to handle New York and New England business. They have added to their lines the production of the Hartford Rubber Works Company, and are now prepared to furnish that company's single tube Tires with their Perfect repair outfit, also their Dunlop Tires, and will carry a stock of these in store, including pumps, valves, repair outfits and rims. H. J. Cassidy has become associated with this house and will manage the Chicago office and store. Edwin Oliver has retired to engage in a line requiring less traveling. The Chicago office has been removed from 64 Ohio street to 139 Lake street, where a stock will be carried for making prompt shipments. A catalogue is in preparation, which will shortly be issued.

THE PLYMOUTH CYCLE MFG. COMPANY, Plymouth, Ind., have purchased the good will and business of the Marble Cycle Mfg. Company of the same place, and have also assumed their liabilities. The new company announce that, with increased capital and largely augmented facilities, they will be fully able to maintain the high standard of the Smalley Bicycle, and that they will be thoroughly prepared to meet all demands for them for the year 1895.

Success with Bicycles.

J. B. Shannon & Sons, Philadelphia, were, we are advised, among the first retail Hardware houses in Philadelphia to add a line of Bicycles to their well assorted stock of Hardware.

Their experience last year has been so satisfactory that they have decided to make Bicycles and Bicycle Sundries a part of their regular business. The only trouble they experienced was in getting a well-known make that had not already an established agency. They think that the Bicycle trade properly belongs to the Hardware store, and that Hardware dealers have been remiss in not taking hold at an earlier date of this profitable branch of their business. They have not as yet made any arrangements for the season of 1895, preferring to wait until the annual Bicycle exhibition is held in January. They pursued a policy of advertising liberally in the daily papers, using cuts of Bicycles, and giving a list of the machines they had for sale, with weights and prices. The advertisements attracted attention and produced good results.

The Clerks' Hardware Club.

BY ONE OF THE MEMBERS.

ONE evening in October, 1893, just before closing time, the collector for our establishment incidentally remarked, as he put on his hat and coat, that the merchants of Iron-town, a suburban settlement, had formed a society to secure better feeling and promote their mutual welfare.

The Project.

George Plumb, our Builders' Hardwareman, observed that he noticed these associations were always formed by the merchants, and if it were a good thing for the bosses, why not for the clerks?

"Do you mean a sort of club to be composed of the boys in our store, or from other stores also?" asked the window dresser.

"Oh, from other stores also," said George. "Now, there is Smith—Jones & Cummings' man. I met him at an architect's office, and in talking over methods of figuring plans he gave me some pretty good pointers. Now, why not call some of the boys together, get a meeting place and discuss the best methods of doing our particular work?"

"The bosses might kick," said the tool man. "They might think that we would meet to discuss *them* and talk over *their* methods and give away *their* schemes."

"Oh! I think not," said George, "if we put it to them so that they can understand that the more we know about our business the better it will be for theirs."

With this preliminary conversation we mentioned our plan to the clerks of half a dozen firms, and while some "did not have time," we observed that the best of them were anxious to meet with us. We secured a vacant room on the third floor over one of the Hardware stores, the proprietors of which, instead of objecting, gave us the use of the room rent free, and promised to look in occasionally and give us the benefit of their experience.

As all our stores—excepting the wholesale ones—were open in the evenings we could not all be present at the first meeting.

The First Meeting.

The first evening we met was devoted to the usual proceedings of new societies—electing officers, forming rules, &c. A committee was also appointed to see the heads of our firms regarding night work, the result of which was that where the boys previously had had no definite arrangement regarding their absence in the evenings, they were now to work night and night about, so that each clerk got three nights off every week. The society was to meet once a month at the start, and if found desirable, twice a month.

The Committee on Best Methods of Work was composed of a bookkeeper from a wholesale house, our collector and the stockkeeper from a tool house. The Committee on Entertainment consisted of our Builders' Hardwareman, and an all around clerk from the 10-cent store, as we called the establishment he was connected with, owing to the number of little round baskets containing Hammers, Tack Claws, &c., displayed on terraced stands outside the store with tickets labeled "10 cents for your choice."

As the committee found the other members very backward about preparing any papers for the next meeting, they decided to start the thing themselves, the bookkeeper and our Hardwareman consenting to have something to say, but were cautioned to make it short and not to be too dry.

The Second Meeting.

The next evening found us in pretty good shape, and when the bookkeeper arose to read his paper he found himself before an audience of 15 very critical young men.

He began by saying he knew nothing but what was practical, and not too much of that. After intimating that his paper would not be too long he proceeded to discuss the subject he had chosen.

Mottoes in Business.

He began by referring to the fact that to become successful in business is the ambition of every young man who stands upon the threshold of a commercial life, but expressed the conviction that very few young men have a clearly defined objective point, but drift from one occupation to another with no special interest in anything. It was pointed out that one cannot expect to be successful in his work without enthusiasm and that character based in morality and religion is the foundation of success. He thus continued:

The value of mottoes is appreciated by many successful business men. While in the lumber region of Pennsylvania I went through a large saw mill equipped with the latest machinery, everything working with precision, not a hitch anywhere, and every man in his proper place with his attention riveted upon the work in hand. In a prominent place was the following: *Order is heaven's first law, and in another, Sleep, eat and drink with your business.*

The latter was somewhat puzzling at first, as it might be interpreted as advising such a concentration of mind

on business as to be harmful, but one of the men explained that it meant that a man should think about his business only in such a way that it would not interfere with sleep, eating or drinking.

In an Ohio town I know a business man who has a motto he does not display quite so conspicuously, but reserves it for the edification of his clerks who come to him for a "raise." *Cheap help is good economy.*

A bookkeeper left a position that

seemed very desirable and gave as his reason that his motto was *There can be no life in the branches of a dead tree.* When this firm went under some time after the enigma was understood.

The effort of the bookkeeper, the character of which may be inferred from this brief sketch, was well received and called out an interesting discussion. When the clock struck ten a motion to adjourn was carried.

The Annual Stock-Taking.

In the following columns we give some suggestions from practical Hardwaremen in regard to desirable methods of stock-taking, intending to refer to the matter more fully in our next and subsequent issues, so that our readers can be in possession of information as to improved methods which will perhaps aid them in taking stock at the close of the present year.

THE FOLLOWING ADVICES from a Hardware house who give a good deal of attention to the details of business and with excellent results will be found to embody useful information and suggestions:

Taking Stock.

Perhaps less real attention is given this important part of a business, as a rule, than is given to any other matter connected with the business. Yet it is the most important, the all important detail, at the ending of a year. The actual knowledge of what you have done, what you are worth, how you have done it, and whether or not it can be improved on another year, should be, and is, the goal toward which we all look at the ending of every twelve-month.

Too much care cannot be given an inventory; too little is the rule. To many merchants it becomes a bugbear, an unpleasant memory of the year's work, something to be hustled through with and gotten rid of at any cost and in almost any way.

It seems to the writer it need not be so with any one. With a little care and system it may be gotten rid of almost pleasantly, and it certainly is a pleasure to know thoroughly what your business has done for you during the year—to have your stock rearranged, classified and put in shape for another season's business. And the great object to be attained outside of the knowledge of profit and loss is the satisfactory arrangement, cleaning up and cleaning out, and distribution of goods this one time in a year, if it is not done more often than this.

The writer has given the matter personal attention for a number of years, and has made some method or system for it, which now that the time is near at hand, is offered for what it is worth.

Getting Ready.

Under this head, a few days before the actual time arrives, we put two or three men at work in out-of-the-way places in the house, assorting, bunching and bringing together goods of a kind that are scattered or separated—this particularly in cellar or upper floor goods that, during the year, become sadly disarranged. Each man

carries a pad of blank slips on which he makes count and leaves with his package, saving the work of going all over it again, and cleaning thoroughly and arranging as he goes. This he can do, as it is mostly done among out-of-season goods, and where the demand would not necessitate changing the count of them too often.

In such places as a Glass department is included the cutting up of all broken Glass to sizes, the barreling of refuse for the junk dealer, &c. In the Oil room, the cleaning of measures, taking care of the waste Oil and getting empty barrels ready for shipment. It may be suggested that these things take time. They do, but they take very little as compared with what they save on the general round up, and it is surprising what two men will accomplish at work of this kind when started out with only that in view.

As the time for the actual invoice draws nearer we have a day for

Measuring and Counting,

which includes all the lines of goods that would occupy hours and days of time, if brought into the actual work of making memoranda. Such goods as floor and table oilcloths, duckings, drills and carriage goods, the weighing of all loose goods—as nuts, washers, malleables, horseshoes in bins, hinges, &c., would come under this work, and in this, as in all the balance, everything is left clean and properly arranged, with the ticket ready for stock taker's memorandum.

Tables and Rules.

There are a great many good tables of weights and measurements, and rules that can be used in such work, lessening the time, and effective, if in good hands. For rubber and leather belting, steel and iron tire, &c., we let them apply without the actual work, because we know them to be correct, and they save those most valuable things—time and labor.

Guessing.

A great deal of it is done in making up an invoice, or in getting ready for it. It is better to make the rule to allow none of it. We feel we cannot afford to guess at anything—nails in

bins or screws in boxes. While the amounts at variance are small, the aggregate might be large, and the system or precedent established is a bad one; for if allowed to guess at one line, it is more than likely to be carried into others and result in serious errors.

The Bookkeeper.

In this time of getting ready the bookkeeper is getting up all his work: his accounts footed and closed, ready to carry into their final closing up; his statements out as nearly as possible for the first of the year; his general books well entered up, so that he is ready to help in the taking of sheets or books, as the case may be, when the actual work begins.

Taking Memoranda.

We have never used any special system of sheets, books or blanks for the work, nor do we advocate any for a retail Hardware business. We use, and have for years, a strong, flexible, broad ruled book, that can be gotten in any store—in size 8 x 12 inches—which we find much better than anything else, and being now ready for the work, we put one book with two men, letting them work always from the back end of a stock and save interference with sales, keeping one or two men on the floor to care for customers entirely, and save those at work from being taken away. Each two men take a department and work through it, still keeping up the thorough clearing up and arranging, and here is where we find the benefit of the former work, for a great deal of it is done, and done by men whose time was not so valuable as those at work.

With this certain amount of system, this two or three days of getting ready, we find we do now easily in four or five days what formerly took us eight or ten, and do it a great deal better. And I venture the assertion that in any store whose stock ranges from \$15,000 to \$25,000, it will be profitable to use it as far as it may be called system. We know where we are—know what we have. We have brought together and cleaned up and arranged our entire stock. We have cut out all that is unsalable or in anywise dead and put it out on counters, brightening it up and putting a price on it that will sell it, and while the final figuring up is yet to be done, the greatest result of good stock-taking has been accomplished.

An enterprising house in Illinois whose management is characterized by good business methods give the following suggestions on the subject:

Classification.

In stock-taking we use no form or blanks. We take an ordinary blotter, large enough to last five or six years, classifying about as follows:

Sporting Goods;

Showcases;

Shelf Hardware;

Tinware;

Nails and Heavy Hardware;

Stoves;

Shop stock;

devoting as many pages to each as may be necessary.

Prices.

We invoice all Shelf Hardware, Cutlery, &c., as marked. Nails, Tin Plate, Galvanized and Black Sheet Iron, Sheet Copper, Lead Pipe, Carriage Bolts, Screws, Files, Butts, Strap and T Hinges, Chisels, Augers and Bits, we invoice at market prices, if same is less than the cost price; if market price is more than cost, we invoice at cost, as we do not consider a profit until the goods are sold. We always put in about two weeks getting our stock assorted and in good shape before commencing to invoice.

Without going into much detail a Hardware house in New Jersey refer to their methods as follows:

Since the organization of our firm we have made it the rule to inventory annually, and find this way satisfactory:

Each Floor Separately.

Take account of stock carefully, beginning at top story of building, keeping account of each story separately, as well as the cellar. We found this plan very successful after a fire next door and when goods principally in our upper floors were damaged. We inventory January 1, and the fire occurred in February, so we could estimate our loss very accurately and without a particle of objection on the part of the insurance company's adjusters when they saw our inventory book.

Prices.

In regard to pricing—all shelf goods in good order we inventory at cost, and such goods as Screws, Bolts, Iron, Axles and heavy goods we inventory at market price at time of inventory.

The following communication from a house in Mississippi contains a number of practical suggestions which will be appreciated by our readers:

While our concern is small as compared with those of many of our readers, we are very careful in this regard, and while our system may not be the best, we have found it after 12 years' trial, with changes, to suit our business, to answer our purposes well.

Our System.

The force is divided; each man taking a section and commencing at one end of the stock. The wall is followed till we arrive at the same point on the return, thus nothing is overlooked. We use a ticket system, and as a clerk counts each package he enters the amount and cost there marked on the ticket, putting it under the package, leaving one end so it can easily be pulled out. After he has finished a section the buyer of the house takes out a ticket at a time calling off the same to the entry clerk, at the same time glancing at the contents of the package to see that no gross error has been committed in counting, and if there has been a radical change to warrant an alteration in cost he does not call off the cost from the ticket, but leaves it to be supplied later. Any buyer can come very near the price of most goods as he progresses, provided he is a man who keeps up with his business. Each section is followed up in this manner till the entire stock is taken.

In taking oils in barrels, we measure the depth and diameter of the barrel and calculate the number of gallons.

With belting we use a rule we have found very correct by measuring the diameter of the roll and counting the laps. It is then figured out, as stated

in many of the catalogues of the manufacturers.

In putting down we use

Three Books

as a matter of convenience when we begin pricing articles that have changed, as one can price one book while another is extending, and a third footing. The books are indexed, so that when an article is called off the entry clerk can turn to the division in the book for say Building Hardware or Tools, Plows, &c. Thus, when they are to be referred to after completion, it is an easy matter to find any article.

While we claim nothing new in this, there may be points that will aid some one, and if you can use any part of it you are welcome to do so.

Successful Handling of Bicycles.

BY ABRAHAM ISRAEL.

THE MODERN BUSINESS MAN who is alive to the demands of

the present day, and who is sufficiently energetic to undertake to satisfy them, will lose no opportunity to increase his profits by the addition of lines of goods which can be handled with ease, and without interfering with his regular trade. That the successful merchant of to-day appreciates this fact is evidenced by the gradual extension of his business and the increasing variety of his stock in trade. The old school merchant confined his efforts to selling a single class of goods—dry goods, boots and shoes, clothing, books, groceries, &c.—and contentedly settled himself down to supplying the needs of those who desired anything in his particular line. But with the growth of competition and the rivalry for trade there came a cutting down of the margin of profits, and the consequent necessity of selling more goods to about the same number of customers. This desire to swell sales naturally led to a very decided encroachment on what was considered the rights of other merchants, until finally all barriers were broken down and now it is considered perfectly legitimate to sell boots and shoes, dry goods, house furnishing goods, groceries, &c., under one roof.

Taking Up Bicycles.

With the advent of Bicycles there sprang into being in the larger cities agents for their sale, most of them young men who found time outside of their regular occupation to turn an honest penny now and then in this way. These men soon gave way to the Bicycle stores, who had things pretty much their own way for several years. Then it occurred to some enterprising Hardware dealer that Bicycles were closely allied to Hardware, and the fond delusion they had so ardently hugged of their being a toy or a plaything which had grown into a popular fad and would soon pass away dropped like scales from their eyes. The wheel has come to stay, because it has passed from a luxury into a necessity. Thousands of them are annually sold by the Hardware jobber to the retail Hard-

wareman, who has found their sale satisfactory and profitable.

Bicycles are far less bulky than Stoves or Refrigerators, are easier handled and pay better profits. They do not require as much room as is generally accorded them, and the technical knowledge necessary in order to talk up a "bike" to an intending purchaser is readily acquired.

The Assortment.

For a retail Hardware store in a town where Bicycles are used, we should advocate carrying an assortment of one or two wheels of each kind of two grades, and would confine our efforts to pushing the sale of one particular make of each grade. We should advise securing the agency of the most popular machine in the vicinity, and of placing an order for one or two first-class pneumatic tired roadsters, a couple of lighter weight wheels, a racer and a lady's safety, and about the same assortment of a second grade machine. We believe in carrying two grades of wheels, because there are two recognized classes of buyers, and it is best to confine sales to one line of each grade: 1, in order to reach the quantity discount; and, 2, to enhance the popularity of the make handled, as intending purchasers prefer a machine with which they are somewhat familiar, and salesmen can always do better with the wheel to which they pin their faith. In addition to the stock referred to above, a couple of children's wheels will be found equally salable; and the writer considers the carrying of a small line of Bicycle sundries as absolutely essential to the equipment, and they pay a handsome margin of profit. These sundries, however, should be selected quite carefully and ordered rather conservatively, the general tendency being to overstock.

Stimulating Trade.

There are, of course, many methods which will occur to the dealer to stimulate the sale of these goods, but a few suggestions as to the policy pursued by some of the most successful dealers may not come amiss in this article. A well written advertisement in the local newspaper, showing the cut of the Bicycle handled, inserted judiciously, rarely fails to bring its proper return. Place one or two wheels in the show window, and they form an attractive and ornamental setting for the remainder of your display. Encourage wheeling in every conceivable way. Advocate good roads. If practicable, ride a wheel, thus setting a shining example for emulation, and have your family and clerks use them as far as you can induce them to do so. Take an interest in the local Bicycle club, or, if preferred to do so, select the most popular of your employees and have him join the organization with the understanding that he is always to keep an eye open for the main chance. Promote a road race, donate several nice prizes, and run it with the co-operation of the members of the

wheeling clubs. This is one of the best schemes that can be adopted, and has been used by merchants who were in no way interested in Bicycles simply for the sake of the free advertising they derived from it. The newspapers will devote their best columns to items relating to the Smith and Jones Road Race, and the whole country will turn out the day of the tourney to see the sport. Not only will this bring the establishment prominently before the public as a business firm, but it will place you on an intimate footing with the bicyclists and secure their good will.

A Repair Department.

In connection with the sale of Bicycles the question arises as to the desirability of conducting a repair department. We should say that where there is a tin shop that this repairing

could be easily managed. A good practical tinner, who is a handy man, will have very little difficulty in attending to the majority of small breakages which are liable to occur. The cost of the additional tools necessary is very slight, and a small stock of spokes, cement, nuts, &c., will be all that is necessary for general work. Where there are bad smash ups, or in cases involving peculiar skill, the best way would be to send the machine to the factory. These odd jobs are fully as profitable as any work done in the shop. We do not, however, believe it would be a paying venture to attempt repairing of this sort without doing other work in the shop, unless, of course, there was sufficient of it to warrant the laying in of a complete outfit of tools, and to keep one or two good workmen busy.

Letters from the Trade.

Our readers are invited to discuss in these columns questions of trade interest connected with the manufacture or sale of Hardware. We shall be pleased to have a free expression of opinion on subjects deserving the attention of Hardware merchants and manufacturers.

Net Prices.

Most of the expressions which come to us from the retail trade in regard to the net price question are against the abandonment of list and discount and the substitution of net prices for goods. Correspondence which we have already published on this subject refers to the difficulty that the careful buyer has even under the present system in keeping track of prices and points out that if the net price system were adopted the difficulty would be immensely increased. Some in the trade evidently regard the tendency with something like alarm under the impression that if net prices came into general use it would be practically impossible for the small merchant to keep informed in regard to the market prices, so that he would be compelled to pay whatever the manufacturer or jobber might ask him—doubtless a somewhat exaggerated view. Some of our correspondents also have expressed themselves as unwilling to purchase from houses that insist on quoting net prices on goods usually sold from list and discount, intimating that the naming of these prices is a method adopted by the jobbers to get more than the market value of the goods. The following letter from a house in the South discusses the subject, it will be observed, in a careful and conservative manner:

At first sight I should view the disposition to adopt net prices in this business with alarm. That there are intricacies and troubles connected with this discount and list plan no one can doubt. There are inconveniences and frequent annoyances hard to keep pace with, but at the same time it has been one of the greatest safeguards to this business. In nearly every other line of business where net prices have been adopted it has been in a large degree ruination to the business for the reason that every man and any man can take

up the business as in groceries, boots and shoes and dry goods, whereas they cannot take up the Hardware line owing to the manner in which the goods are quoted and sold—thus it has had a salutary effect in keeping out objectionable people. Then again, it has prevented in a large degree widespread cuts being made to the smaller trade over the country. I think you will agree with me in the statement that jobbers are more nearly confined to the Hardware business than in any other, and I attribute this largely to the reason of the intricacies connected with the price of the goods. For instance, sugar, we will say, is worth 4 cents per pound; if it was quoted at 8 cents list, with its discount, the chances are that a large number of people would not take the trouble to figure out what the net price would be, and thus become thoroughly posted on this price; but if it was quoted at net price there is but one price to be kept in the head, and the result will be that every man will retain the price and thereby prevent such a thing as reasonable profit on it. On the other hand take Wrought Butts, which are sold at discount; if they were once gotten down it would be much easier to raise the price on the list and discount basis than it would be on the net price basis for the reason just stated above; few men carry the list and discount in their heads in all the numerous articles in the Hardware business sufficiently well to enable them to keep up with the cut-throat prices, whereas the net price would be prominent in their heads all the time. Again, Butts are at a price that is ruinously low. When we make the raise it will be not only the list but the discount also which will prepare the trade to receive the advance that they would not receive without a good deal of kicking on a net price. I have thought over the matter but little, but have always been under the impression that the list and discount has been a safeguard, preventing many people from entering the Hardware business. I can see no objection in the world to the discounts. When a man really understands the business the figuring is a very small matter, and in the end it makes him the more diligent in trying to keep up with a difficult matter. If

it were plain and simple he would likely become careless and unobservant.

A well-known manufacturing company putting a large and varied line of tools on the market thus express their convictions as to the impracticability of a general abandonment of lists and discounts :

To have catalogues with net prices, and to accommodate the retail trade who ask for prices would necessitate the issuing of two lists, which would have to be replaced with a new one every time any change occurred in prices. If catalogues were issued with only illustrations (cuts) to represent the style and kind of goods manufactured, without giving any prices whatever, it would require special price-lists, which would also have to be replaced with every change in prices, all of which would be more expensive than getting out a new discount sheet, and this, as far as we can see, without any particular advantage to the jobber, only in the way of saving of a little time in figuring when requested by the retailer to bill his goods net prices, which is not generally requested of the manufacturer, and why should it be in general of the jobber? We think there are other disadvantages to offset this. We cannot see the disadvantages of the present system of lists and discounts in keeping posted in comparison with net prices, with the often receiving of new special price-lists as changes may occur, which, it seems to us, would make matters much more complicated.

We are unable to perceive or understand wherein the quoting of discounts leads to closer margins, or if net prices be adopted how the profit would be better, or larger margins secured to the jobber, unless the retailer is entirely ignored by the manufacturer and kept in the dark as to prices the manufacturer has for the retailer. We are of the opinion that this would meet opposition and serious objection by the retail trade and bring discredit to both the jobber and manufacturer. So we are of the opinion that it would be more to the satisfaction of the Hardware trade as a whole to retain the established methods of buying and selling from lists with various discounts, and certainly more advantageous to the manufacturer, as we view it at this time.

Buyers and—Buyers.

The following communication is from the buyer of a large and well-known manufacturing house. It touches upon the disinclination of the jobbers to introduce new articles to their customers. We are pleased to submit our correspondent's inquiry to our readers :

Being a buyer of a large factory I had occasion one day to call on the buyer of one of the largest wholesale Hardware establishments of the West. A Lock agent had just left.

"Do you know," said the buyer, "that man has a Drawer Lock that looks like 'a winner'?" "What do you consider 'a winner'?" "Well," the buyer continued, "that man has—

"1. A Lock that is a Lock;
"2. It is simple in construction;
"3. It can be manufactured cheaply;
"4. It can be easily and cheaply attached."

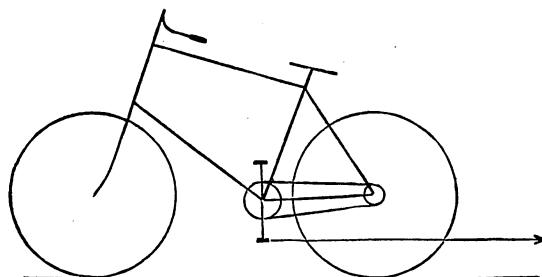
"Well! I suppose you will sell lots of them?" "That one point lies with him. You will notice I said looks like a winner," and the buyer continued "looking like a winner and being one are two different things. I told him I thought he had a good thing, better in my opinion than anything I had yet

seen, but my private opinion and the opinion of the public were two entirely different things. When he creates a demand for that Lock so that furniture men come and ask for it, then, and not until then, can I afford to sell it. I know that they ask for other makes—Locks that have won a reputation and have an established value. Well, that fellow does not yet understand why I won't buy his goods and push them. "I can better afford to make a

Two Problems.

1. The Bicycle.

The sketch herewith given, for which we are indebted to *The Engineer* of London, represents a common form of rear driving safety bicycle standing on the ground, with its cranks verti-



smaller profit on an article that I know has won public favor than get 'stuck' on one that promises a larger profit and looks like a winner, but fails to keep its promises and whose looks have deceived me."

To create a demand belongs to the inventor and manufacturer.

To supply the demand after it has been created belongs to the merchant.

Other buyers may do the introducing of goods if they want to, but I have had enough of it. I prefer to use my energy to control the "demand for goods of established merit."

Was the buyer right or was he wrong?

Greene, Tweed & Co.'s Catalogue.

GREENE, TWEED & CO., 83 Chambers street, New York, have issued a revised illustrated catalogue and price list, showing not only their own manufacture of specialties, but a full line of manufacturers' and mill supplies. The book, $7\frac{1}{2} \times 11$ inches in size, containing 379 pages, is well bound in cloth. It is the intention of the concern not only to issue the catalogue as a whole, but to also divide it and to issue in nine separate parts, so that the smaller catalogues will be suited to the different branches of trade. In this way they can send a customer a catalogue covering the line of goods in which he is interested.

Each of the smaller catalogues will be accompanied by a discount sheet, so that any one can order what is required with a full knowledge of the cost and quality. The smaller books will cover the following lines of goods, an enumeration of which will convey an excellent idea of the scope of the large catalogue : 1, goods suitable to the Hardware trade; 2, Belt- and everything pertaining to it; 3, mill supplies; 4, piston packing, oil, oil tanks, Babbitt metal, &c.; 5, hose, hose pipe, reels, and fire department supplies; 6, mechanics' and blacksmiths' tools; 7, contractors' supplies, nuts, bolts, tackle blocks, &c.; 8, engineers', steam and plumbers' supplies; 9, polishers' supplies, leather, &c. Among the specialties to which the company call attention are genuine Blake's belt studs, Champion wrenches, piston packings and polishing leathers. Of the latter they carry a large assortment, including elephant hides, zebra, hippopotamus, buffalo, sea lion, bull neck and walrus leather.

cal. The bottom pedal is pulled by means of a string in the direction indicated by the arrow. In which direction will the bicycle move?

2. The Chain.

The following problem is propounded by a noted chess expert : A farmer has six pieces of chain of five links each,



and he wants an endless chain of 30 links. He can get a link cut open for 8 cents, and welded together again for 18 cents, or he can buy a new chain for \$1.50. Which is the cheaper?

Wright Shovel Company.

WRIGHT SHOVEL COMPANY, Anderson, Ind., are extending their plant and making arrangements which will give them a prominent position as manufacturers of Shovels, Spades, &c. Heretofore they have confined their operations to the manufacture of open back goods, or what is known as the Cleveland Pattern Shovels and Scoops. They have recently erected a building 50 x 300 feet, which will be another complete Shovel plant fitted up with all the modern machinery for making the Plain Back Shovel. They expect to have their new plant in operation by December 1, when they will manufacture Plain Back Shovels and Spades and also a full line of Ditching and Drain Tools. They expect to be in a position to deliver goods to their customers by January 1. Their catalogue for this new department is not yet completed but they expect to issue it some time in December.

SPERRY & ALEXANDER, 28 Warren street, New York, importers of Cutlery and small Hardware, have enlarged their line of Centaur Pocket Knives and Razors by the addition of many new patterns. These goods of German manufacture are offered at somewhat reduced prices owing to tariff changes.

Arrangement of Stores.

CHANDLER & BARBER.

THE ILLUSTRATIONS herewith given relate to the Hardware establishment of Chandler & Barber, 15 and 17 Eliot street, Boston. The building is 24 x 98 feet in size, and the main salesroom is arranged as shown in Fig. 864. A show window occupies a large portion of the front of

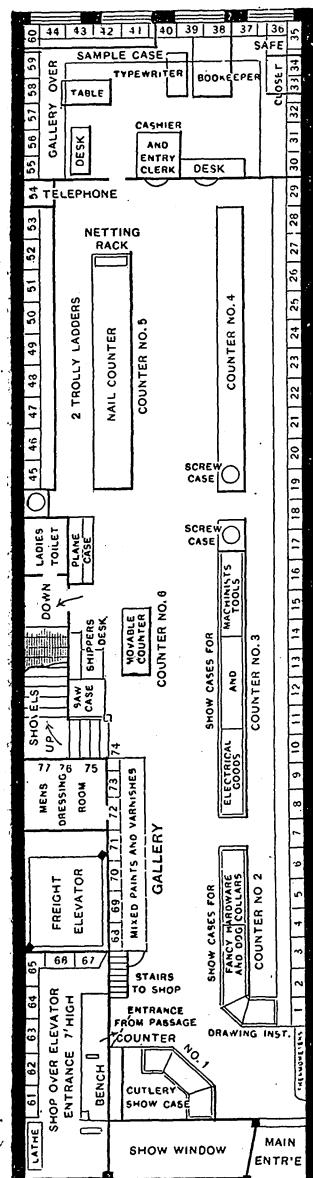


Fig. 864.—First-Floor Plan.

the store, with the entrance at the right. The right hand side of the room is shelved to the ceiling, part way up for wooden boxes sampled, the rest of the distance being devoted to Shelf Hardware in original packages. The shelves include Upholstery Goods, Brass and Bronze Drawer Pulls, Catches, Brass Butts, Pulleys, Sash Fasts and Sash Lifts, Cabinet, Pad and Rim Locks and Bolts, Casters, Wrought Goods, Chisels, Screws, Tacks, Butts, &c. Three trolley ladders are provided for this side of the store. In front of the shelving are counters and showcases. The left side and a portion of

the rear of the office is fitted up as a sample room for fine Builders' Hardware. Drawers are provided in which sample boards of different kinds of woods, suitably finished for the style and finish of the samples, are kept. Other sample boards stand on the ledge above the drawers, while others are fastened against the walls. The latter may be taken from their position to be shown or to be refitted. A gallery with shelving extends entirely around the office, containing Door Knobs, Coat and Hat Hooks, &c., the gallery being reached by rolling ladders. Next to the office, on the left of the store, is shelving with trolley ladders, in front of which is the Nail counter shown in Fig. 865. The counter has a cherry wood top and cherry stained fronts. The arrangement for Nails was original with the firm, who refer to it as exceedingly convenient. The counter is 20 feet 2 inches in length, 3 feet in width, and 2 feet 10 inches in height. It contains 32 bins on each side, one side being used for Cut and the other

compactness, neatness of appearance, and the ease with which they can be taken entirely out for filling or when selling a large quantity of Nails.

At the end of the counter is a rack for Wire Cloth, made with two uprights something over 6 feet in height, upon which are screwed harness hooks like Sargent's No. 9. These have the proper pitch to keep a roll of Wire Cloth, after it has been used, in place without tying.

From the shelving back of the Nail counter to the front of the store are toilet rooms, stairway and freight elevator, in front of which are cases for various lines of goods. Among these is a case for Plumbs and Levels, with a Level adjuster, as shown in Fig. 866. The adjuster is made from a two-foot cabinet clamp, fastened by a strong screw, and well fitted to the edge of the shelving. The adjuster rests on an adjusting screw, which can be raised or lowered until it is level. To plumb the Level the adjuster is raised to a vertical position. The

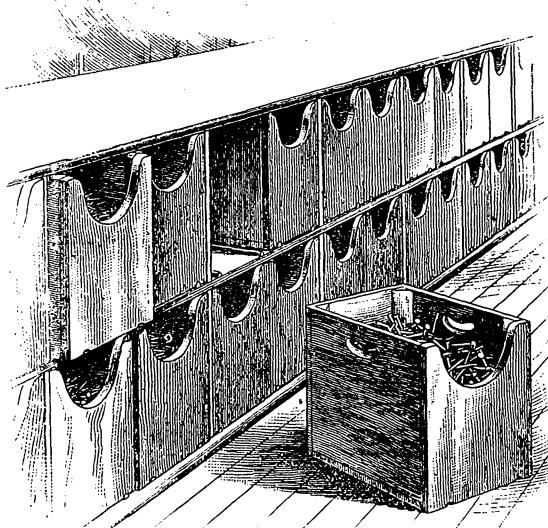


Fig. 865.—Removable Nail Bins.

side for Wire Nails. Each bin will hold more than a keg of Nails, the outside dimensions being as follows: 16½ inches long, 14½ inches wide and 15½ inches high. The bins are made of pine, the ends being $\frac{3}{8}$ inch thick and the sides $\frac{3}{4}$ inch thick, with the size of Nails stenciled on the fronts. The corners are strengthened by angle pieces nailed and glued in. The outside edges of the bottoms are grooved lengthwise across the grain, and in these grooves half round cherry strips, fastened on the bottoms of the openings, fit, keeping the bottom of the bins $\frac{1}{4}$ inch above the bottom of the opening to allow for dust. The half round strips or runs were lubricated with paraffine or Baberry tallow and have been used for three years without relubricating, working freely and without noise. The bins are referred to as having advantages over the usual style, among which are mentioned

means of adjusting this in an upright position is an adjusting screw passing through a nut attached to the side of the case, the screw being moved forward and backward as is necessary to plumb the Level.

The front corner of the store above the passage way to the freight elevator is arranged for a repair shop, as in Fig. 867, and is reached by a short flight of stairs. The shop is provided with a long bench on which is a wire cutter and a machinist's vise, with drawers underneath for tools. At the end of the bench is a grindstone, and on the floor beyond is a repair kit which may be taken out for picking locks and fitting keys. On the opposite side is a lathe, above which are drawers containing key blanks of various kinds. The shop, it is remarked, is a busy place all the year round, and a most convenient adjunct to the store, inasmuch as if a key needs refitting or if a

piece of rod is to be cut, a hole drilled in a knob, or anything of this kind needs attention, it can readily be done, while enough work, such as grinding

shipped, among which were Door Knobs, Mortise Locks and Escutcheons, Butts, Double Action Spring Hinges, Bolts, Sash Lifts and Fasts,

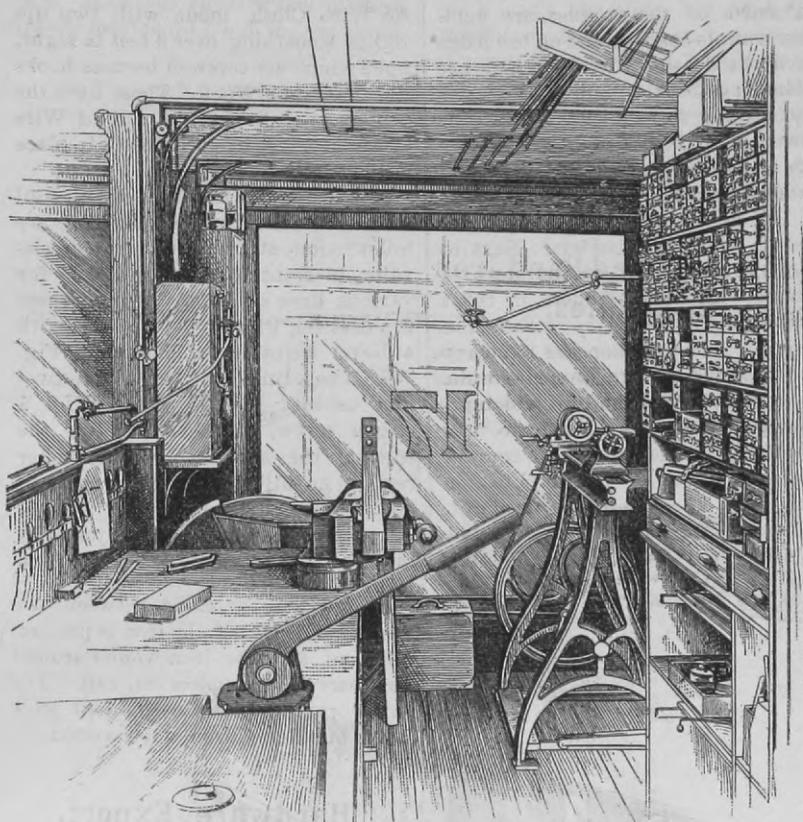


Fig. 867.—Repair Shop.

scissors and fitting keys, is taken in to more than pay the workman's wages.

Fine Builders' Hardware in Mexico.

THE following incidents are believed to mark the beginning of the introduction of fine Builders' Hardware of modern character and American manufacture, in appreciable quantities, into Mexico. The lesson suggested to aggressive and enterprising merchants is that perhaps other profitable lines of merchandise of the higher grades can be successfully marketed in Central and South America, if pressed by specialists. A difficulty thus far has been that a salesman representing a large number of kinds of goods of diverse character usually knows a little about them all, but not much about any of them in detail.

About eight years ago, when American capitalists were completing the Mexican National Railroad, from Laredo to Mexico City, nearly 900 miles long, the company's purchasing agent in New York received a requisition for Builders' Hardware, with which to trim the numerous stations on the line. The agent, being unfamiliar with the details of this class of supplies, sent for our informant, and finally turned the order over to him to execute at his discretion. Naturally native carpenters were most familiar with goods of European manufacture. Bronze Metal goods throughout were

Push Plates, Transom Lifters, Cupboard Catches, &c. For the heavy hardwood station doors the Mortise Locks and flat Steel Keys were a radical departure from the massive

country competent to put them on. The agent sent for the salesman, pointed out to him the scrape he was in and informed him he could order the goods back and pay accrued charges. After a while the gentleman was convinced that as it was an American road, equipped with American rolling stock and other materials, the proper thing to do was to use just what had been sent, and, if necessary, send an American carpenter to put the Hardware on. A long letter was dictated by the Hardwareman and explanations made in detail, and an American mechanic was sent from here to do the work, which finally proved entirely satisfactory.

Naturally the goods were practically samples, to be more or less inspected and criticised by architects, builders and others. Two or three years later in selecting the trimmings for a new store then building, a merchant there went through the manufacturer's catalogue and selected their finest all bronze metal Hardware, similar somewhat to the goods in the railroad stations, with the exception of a front store door Lock, none of these suiting him. This order was sent to a commission house in New York, and the choosing of the Lock left to them. In executing the order a mortise cylinder store door dead Lock was sent. This resulted in an explosion, the dealer in Mexico saying he would not put it on his chicken coop. What he wanted was an 8 x 10 wrought iron Rim Lock, requiring a Key perhaps 6 inches long. As before, detailed explanations finally resulted in the Lock being properly applied to the 4-inch oak door, and the individual more than satisfied, adding

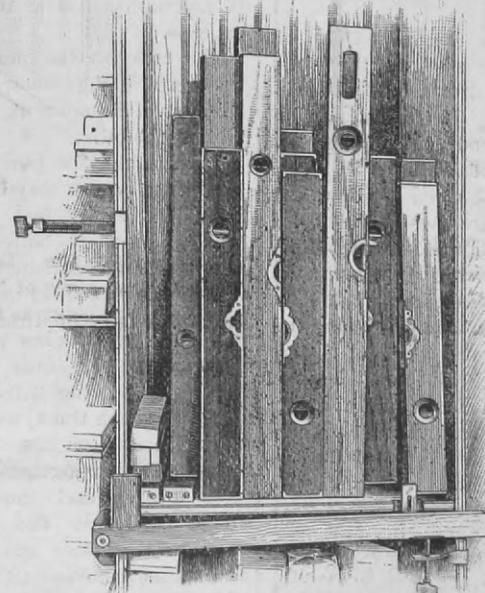


Fig. 866.—Level Case with Adjuster.

Wrought Iron Rim Locks of English make, with Keys to correspond. The articles sent were such as would be used for similar purposes in this country.

When the goods arrived at their destination the trouble began. They did not understand the goods, believed them unfit for the purpose and reported that there was no one in the

"the best of it all is I can carry the Key home in my vest pocket." At about this time a firm in the City of Mexico ordered a stock, we are told, of Mortise Locks, Bolts, &c., as the architects and builders there had inquired for goods similar to those on the stations of the Mexican National Railroad.

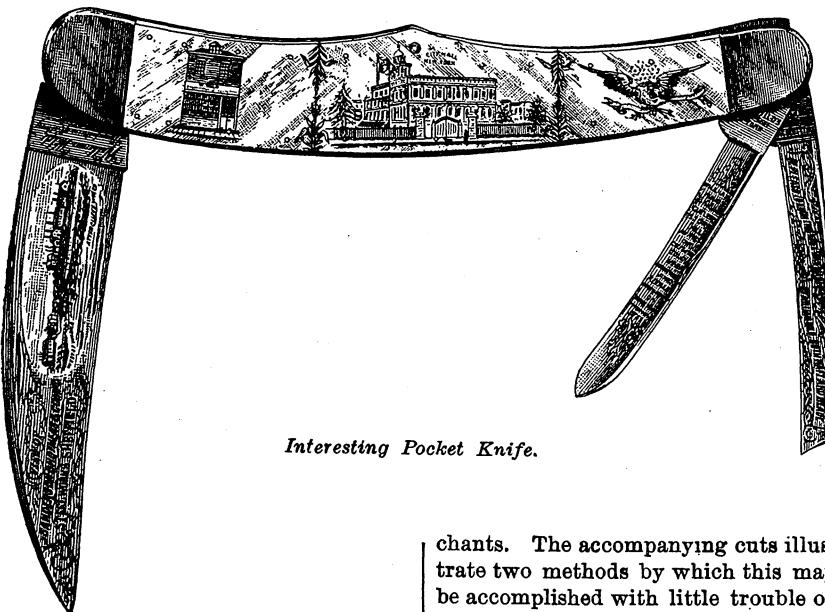
An Elaborate Knife.

SEVERAL interesting pieces of Cutlery recently came to our notice, one of which is here illustrated. These were made by William Wild, Sheffield and New York, and by him used for display purposes. They are now in the possession of White, Van Glahn & Co., successors to the old house of W. N. Seymour & Co., Chatham square, New York, into whose possession they came more than 30 years ago. The three-blade Knife here shown was part of the World's Fair exhibit in 1853, at the Crystal Palace, in what is now Bryant Park on Fifth avenue, New York. When open the Knife is 33 $\frac{1}{4}$ inches over all, the handle being 15 $\frac{1}{4}$ inches in length. Between the German silver bolsters there is a mother of pearl covering on each side,

worth Park, England, depicting among other things a stately building with large grounds. A smaller Knife of a more modest character, 13 $\frac{1}{4}$ inches extreme length, is similarly etched and engraved, the eagle and stars, if any significance attaches to them, indicating that the Knife was made prior to 1836. The remaining curio is a German silver fob, with mother of pearl sides in four sections, in the four corners of which are ten miniature Knife blades, Saws, Hooks, Watch Keys, &c.

Tying Hoop and Band Iron in Bundles.

THE keeping of Hoop and Band Iron in convenient form for retailing is one of the difficulties which presents itself to many Hardware mer-



Interesting Pocket Knife.

divided into three sections, the joints being hidden or disguised by the engravings of leaves. In the first section at the left is a reproduction of the New York warehouse of William Wild, on Division street between Ludlow and Essex streets, where these emblems of trade were kept in the show window. The central engraving represents the New York City Hall, surrounded by the high iron fence taken down in the 70's under the Tweed *régime*. Above the eagle on the right are 27 stars, which probably indicated the number of States in the Union when the Knife was made, which would fix the date as 1845, on the admission of Florida. On the reverse of the handle the engravings are more elaborate in character, delineating the unfinished Capitol at Washington; the new British Houses of Parliament on the banks of the Thames, London, and Newstead Abbey, Nottingham, the family seat of the Byrons, and where the early years of the poet Byron were spent. On the reverse of the large blade is etched a battle scene at Bunker Hill, June 17, 1775, commemorating the fall of General Warren. On the opposite side of the remaining blades are etchings of Chats-

charts. The accompanying cuts illustrate two methods by which this may be accomplished with little trouble or expense.

The two wooden pins attached to the board in Fig. 868 are 6 inches long, 2 inches in diameter at one end and 1 inch at the other. A $\frac{3}{8}$ -inch hole is bored through the pins endwise. To the board, which may be 4 to 8 inches in width and 4 feet in length, the wooden pins are bolted upright, one near each end. A 2-inch cleat is nailed across the board, 12 inches from each end. A bundle of Iron is opened and

pins, as shown in the cut, between which the end of the Iron is held when commencing to wind a bundle.

The other method, shown in Fig. 869, is to take off the hoops from a barrel near the end without the head. Two staves are cut down 1 foot from the top

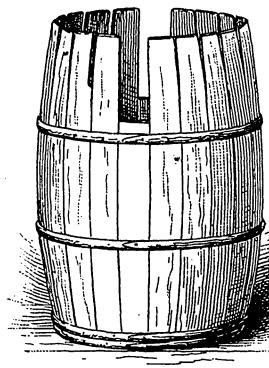


Fig. 869.—Barrel Arranged for Hoop Iron.

opposite each other, and a $\frac{1}{4}$ -inch cut 4 inches long is made between two staves. The end of the iron is put into this cut and the iron wound around the barrel in bundles to suit. The large openings give a convenient place to tie bundles of iron when wound.

Hardware Expert.

GEORGE J. WELLS has established himself as a Builders' Hardware expert, at 97 Chambers and 81 Reade streets, New York. Many years' contact with prominent architects, and a knowledge of their perplexities regarding Builders' Hardware, about which they have probably informed themselves the least, in planning structures, has led him to offer his services as their agent for the inspection of all the Hardware used on any building. He will make impartial written reports, we are advised, as the work on a building progresses, whether the trimmings are according to specification, contract or selection, and whether they are applied in a satisfactory manner. While there are experts in building, plumbing, lighting, heating, electrical and other lines, there are, however, said to be

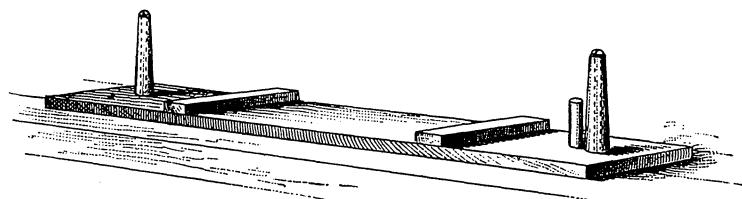


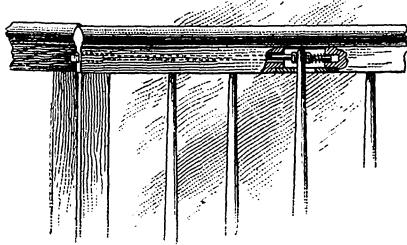
Fig. 868.—Board for Winding Hoop Iron.

wound around the pins in bundles weighing from 1 to 5 pounds, to suit various customers, tied and hung on pins. The cleat holds the bundle away from the board, thus increasing the convenience in tying. A 3-inch pin may be driven into the board on the inside and close to one of the bolted

none who disinterestedly make a business of passing on questions relating to Hardware. Mr. Wells for 11 years was general Eastern agent for the Chicago Hardware Mfg. Company, and later, until October 1 last, was general sales agent of Yale & Towne Mfg. Company. He will be pleased to receive the catalogues of manufacturers of Hardware.

Secret Office Gate Lock.

THE AMERICAN TOOL COMPANY, 200 West Houston street, New York, have on their office gate an original Lock or Catch, intended to mystify the average caller whose presence is not acceptable inside, such as peddlers, agents, &c. In the accompanying sketch is shown a portion of the gate with the rail cut away. A hole was burned through the top rail to admit an iron rod about $\frac{1}{4}$ inch in diameter, on the end of which was fixed a bolt. The third baluster was connected with this, cutting away a portion of the rail underneath to admit of a little play when operating it without the action being observable from either side. At the



Secret Office Gate Lock.

right is a coil spring to keep the bolt in position. The success of the device lies in the fact that it attracts no attention, while those in the secret coming and going can, by a dexterous twist of the hand laid over the rail, operate the bolt without discovering the method by which it is accomplished. This and several other similar schemes have been devised by John H. Patrick, Jr., the secretary of the company.

Fine Cutlery for Holiday Trade.

LANDERS, FRARY & CLARK, manufacturers of High Grade Table Cutlery, have selected from their large stock some very desirable goods which they are offering at their New York sales rooms, 298 Broadway, at a considerable reduction in price. They are suitable for Christmas gifts and holiday trade. In mother of pearl mountings are Carvers, Butter and Cake Knives, Bread and Butter Spreaders, Table and Dessert Knives, Nut Picks, and Orange and Child's Sets. There are Carving Sets in three, five and seven pieces, mounted in ivory, Japanese inlaid work, carved antique ivory and hollow metal handles. Child's Sets can be had in a variety of ivory handles, either in cardboard or plush cases. Handsome Carving Sets in either leather, plush or mouchoir cases at moderate cost are shown in hollow handles, engraved and silvered blades, antique and walrus ivory, and ivory overlaid with sterling silver. The most elaborate piece is a polished oak cabinet, brass bound, with hinged cover and two satin lined trays. In the top are Carving Sets for meat, game and birds, a Boning Knife, Bread, Fish and Pie Knives, together with Salad and Berry Spoons and Cheese Scoop. The trays contain one dozen

each Medium and Dessert Knives and Forks, Bread and Butter and Orange Knives. Enough goods, both in dozens, half-dozens and sets, have been selected to fill two large tables.

Trade Items.

SHULTE, LOHOFF & CO., Evansville, Ind., have recently been increasing their facilities considerably and are now putting on the market a large and varied line of Edge Tools, which are forged throughout of steel to the quality of which they refer. They are now busy in the preparation of a new catalogue which will adequately represent their goods, which include now an assortment of Hatchets, Hammers, Cleavers, Adzes, Turners' Snips, Boys' Axes, Broad Axes, &c. Jacob Selzer, Jr., who represents the company in the South and East, has recently been in New York looking after the interests of the company.

A NEW ADVERTISING SCHEME has been perpetrated on New Yorkers by a Broadway merchant. The large plate glass in the front show window has apparently been shattered by stone throwing. On the glass is displayed an offer of \$1000 reward on the firm's letter head for the arrest and conviction of the person who threw the missile. A closer inspection reveals the fact that pieces of window glass have been fastened ingeniously to the inside of the plate, radiating from an irregular hole 5 or 6 inches in diameter, over which is pasted a piece of manila paper. The illusion is kept up by streaks of a pale green color, resembling cracks, reaching to the sides of the glass. The object naturally is incidentally to get the pedestrian's attention to the goods in the window.

THE GOULDS MFG. COMPANY, Seneca Falls, N. Y., have in press a book which will be devoted entirely to efficient Power Pumps and their applications. In connection with these applications there will be a large number of sketches, illustrating goods in operation for different services, &c. The book will be $6\frac{1}{2}$ inches long and $7\frac{1}{2}$ inches wide, 96 pages, and handsomely bound, and will be replete, we are advised, with new goods and carry much information of value to engineers and pump men generally. The company are desirous of placing the book with all interested parties, and will be pleased to receive applications to add to their mailing lists. The book will be ready for distribution next month.

CHARLES OSGOOD, son of Manager Osgood of the Keating Wheel Company, Holyoke, Mass., and a representative of the company on the road, distinguished himself a short time since by an heroic rescue from drowning of a party of four men. The latter had been cruising on the river, near Holyoke, when a sudden squall coming up their boat was overturned and the occupants thrown into the water. Mr. Osgood, who was among the eye witnesses of the accident, seized a canoe which stood near, and with masterful manipulation guided it to the imperiled party, all of whom he succeeded in pulling aboard.

GEORGE A. WALLER, Seneca Falls, N. Y., is putting on the market the Arctic Ice Dogs or Creepers, illustrations of which are given in his advertisement on another page. These Creepers consist of light malleable iron castings fitted for the sole of the shoe and fastened to the foot by means of a toe-strap and an endless elastic band drawn high over the heel. It is stated that with their peculiar adjustment these Creepers may be attached to boots, shoes or rubbers without difficulty or delay.

Price-Lists, Circulars, &c.

THE BOLGIANO MFG. COMPANY, Baltimore, Md.: Patented Mechanical Staples. An 1894-95 catalogue and price list illustrates Giant and Little Giant Water Motors, One minute Dish Washer, New Electric Fan Water Motor, New Steam Clothes Washer, Ventilating Fans for walls and ceilings, New Air Burning Cooking Stoves, New Air Burning Kitchen Iron, and New Air Burning Soldering Iron.

HORTON, GILMORE, MCWILLIAMS & CO., 172 to 176 Lake street, Chicago: Circular of fall and winter goods. This is a 24 page circular illustrating, describing and pricing Weather Strips, Snow Shovels, Thermometers, Steel Traps, Rat Traps, Oil Cans, Stove Trucks, Door Hangers, Front Door Sets, Screw Drivers, Black Diamond Knives and Steels, Carvers, Table Knives and Forks, Razors, Pocket Knives, Nut Picks, Spoons, Burglar Alarms, &c. They have recently added Kitchen Knives to their Black Diamond line of cheap but thoroughly reliable Knives for general domestic use. They have been appointed agents for the sale of Razorine in Chicago and vicinity.

MANHATTAN BRASS COMPANY, New York and Chicago: Circular of new goods. The circular contains illustrations of the Yale Mammoth Lamp in harp, table and stand styles; Student Lamps in various styles; Alcohol Brass Lamp and Kettle, Warming Stove or Nursery Heater, Banquet Lamps, Hand Lamps, Cadet Lantern, Burners and the Star Oil Heater. A catalogue of other goods made by the company will be sent upon application.

THE KNAPP & PRATT MFG. COMPANY, Geneva, Ohio: Housekeepers' Hardware, Hardware Specialties, Floral Garden and Farming Tools. An illustrated catalogue and price-list shows Iron Spoons, Mincing Knives, Cake Turners, Carpet Stretchers, Ice Picks, Shingling Hatchets, Cross-Cut Saw Handles, Ladies' and Childrens' Sets of Floral Tools, Garden Trowels, Rakes, Hoes, &c. The manufacturers state that a number of new articles are included in the catalogue, and that the goods throughout are of the best.

THE WM. POWELL COMPANY, Cincinnati, Ohio, send out a tin hanger illustrating their plant and several of their manufactured articles, including Metal Cored Rubber Stoppers, Guard Stop and Water Cock with socket head and interchangeable handles, Combination Bath Fixture, Pipes in one casting, &c.

Want Price-Lists, Catalogues, &c.

THE W. J. HEALEY HARDWARE COMPANY, successors to Booth Bros., Mitchell, S. D., advise us that they are about to commence wholesaling Hardware, and invite correspondence from manufacturers of Shelf and Heavy Hardware, Iron and Wood Stock, Wood and Iron Pumps, Rope and Cordage, Ammunition, Sporting Goods, &c., who are desirous of entering into trade connections in that State. The company refer to Mitchell as one of the best railroad centers of South Dakota. The company will doubtless be pleased to receive catalogues, price-lists, &c. from the trade.

Showcase Mats.

C. E. AKINS, 10 and 12 Reade street, New York, is supplying the trade with Plush and Felt Showcase Mats. The Mats have a wide range of size and price and are made in handsome colors and designs. The object of these Mats is to furnish an effective advertising medium at a moderate cost. They may be lettered with the firm's name, or may be made to show special articles which manufacturers or jobbers wish to bring to the attention of buyers. The Plush Mats are made by a special process which is claimed to insure durability, together with bright and attractive coloring of the designs. The Mats are especially adapted to use by the Hardware trade, as they prevent the glass of cases being scratched by change or goods, which would otherwise be laid on the glass instead of on the Mats. Mr. Akins also manufactures other specialties for advertising.

It Is Reported—

Arkansas.

That M. O. Burton's Hardware store, at WYNNE, was recently damaged by fire.

Delaware.

That on the 14th inst. the Hardware store of H. B. Wright & Co. of NEWARK was broken into by burglars. Very little was taken beyond a few Razors and Knives, the thieves having evidently been frightened away.

Illinois.

That Mr. Glanville is the proprietor of a new Hardware store at KENT.

That R. L. Bocock, dealer in Hardware, &c., CANTON, has gone out of business. His stock has been purchased by Robert Groskopf, who has taken possession.

That Rhodes & Mason, Hardware, &c., TOULON, have sold their stock to J. M. Morris and B. Newcomer, who will continue the business.

That the Hardware firm of Graham & Junk, RIO, will soon be succeeded by Junk & Labarr.

Indiana.

That Frank Hoover has purchased his partner's, George Brooks, interest in the Hardware business at ASHLEY, the firm to be dissolved about January 1. Mr. Hoover will continue the business alone. Mr. Brooks has not definitely determined on his future plans, but he will probably devote his attention to farming.

Iowa.

That W. C. Timmons of IDANA, KAN., is making preparations to open a Hardware store at PRESCOTT.

That R. R. Plane & Co., Hardware merchants, INDEPENDENCE, have dissolved partnership.

That W. H. Barbery of EAST PERU has removed his Hardware stock to larger and more commodious quarters.

Kansas.

That the Hardware store of the Curtis Mercantile Company, WELLINGTON, was robbed on the 11th inst. About \$125 in cash and some papers were taken.

That R. T. Williams, dealer in Hardware and lumber, at HIATTSVILLE, has been burned out.

Kentucky.

That the firm of Heinig & Raible, corner Preston and Lampton streets, LOUISVILLE, have been dissolved by mutual consent. C. J. Raible and C. E. Raible will take the assets and pay all the liabilities. The business will be continued by a new firm consisting

of C. J. Raible, George Smith and Chas. E. Raible, under the style of Raible, Smith & Co.

Maine.

That Hanson, Webber & Durham, Hardware merchants, at WATERVILLE, will build a four-story brick block next spring which will be used exclusively by their business.

Massachusetts.

That E. A. Cole has succeeded E. P. Lake in the Stove and Tinware business at HUBBARDSTON.

That Willard Adams is the successor of G. A. Bartlett in the Hardware business at HOLLISTON.

Michigan.

That Kerr Bros.' Hardware store, at COLDWATER, was robbed on the 17th inst.

Minnesota.

That L. S. Johnson of PALMER STATION will engage in the Hardware business at FOSSTON, POLK COUNTY.

That John T. Wilson has purchased the George Lien Hardware stock at GRANITE FALLS.

That Jos. Kraker & Son have discontinued the Hardware business at MELROSE.

That Bell & Howard, Implement dealers, FARIBAULT, have dissolved partnership.

That N. A. Frost is selling out his Agricultural Implement stock at DEXTER.

That Owen Kinsella of OAKWOOD and R. C. Rockwell of Plainview have entered into partnership under the firm name of Kinsella & Rockwell and will conduct the Hardware business at CALEDONIA.

That Wm. Lockwood of EDGERTON, is disposing of his Hardware stock.

Missouri.

That G. W. Wright of CARTERVILLE has opened a stock of Hardware at SILOAM SPRINGS.

That G. E. Dice, dealer in Hardware, Harness, &c., WEATHERBY, has disposed of the Harness department of his business.

That Keystone Implement Company, KANSAS CITY, will re-erect their storehouse, recently burned. The new building will cost \$20,000.

Nebraska.

That A. C. Lederman, GRAND ISLAND, has been succeeded by the A. C. Lederman Company.

That J. M. Filebrown & Co., GEN-EVA, Hardware and Implement merchants, have been succeeded by H. L. Smith & Co.

New Hampshire.

That the Hardware store of I. B. Moore, at ROCHESTER, was entered by burglars on the 18th inst., and a quantity of Revolvers taken.

New Jersey.

That Klosterman Bros., Stoves, CAMDEN, have been succeeded by Klosterman Bros. Company.

New York.

That the Hardware store of O. E. Gaffey, WATERTOWN, was burglarized on the 18th inst., and a quantity of Revolvers and Razors carried off.

That Ransom & Wilcox, Stove dealers, LITTLE FALLS, are erecting a stone and brick building, 30 x 40 feet, in the rear of their store. The addition will be used as a tin shop.

That several attempts have been made recently by thieves to effect an entrance to the Hardware store of Ferdinand Rechts, at 140 Grand street, BROOKLYN. Early on the morning of the 25th inst. the last attempt was successful, an entrance being effected from the rear of the store, and Tools valued at \$270 were carried away.

Ohio.

That burglars entered the Hardware store of W. H. Wagner, SIDNEY, on the morning of the 11th inst., and carried off \$500 worth of goods.

That the Pioneer Hardware Company have been organized at PIONEER. The company will commence business January 1.

That the Hardware store of S. N. Closeman & Co., ZANESVILLE, was burglarized recently and \$800 worth of goods stolen.

That A. F. Patterson of CHESTER HILL was recently burned out.

Pennsylvania.

That J. W. Maan, BLOOMSBURG, Hardware dealer, will add a wholesale department to his business, and will make a specialty of Bicycles.

That W. J. Hymes of WILKES-BARRE has opened a new Hardware store at MINER'S MILLS.

That John Von Beck has purchased an interest in the Hardware business conducted by Jones & Devers, at CARBONDALE.

Rhode Island.

That the Pascoag Hardware Company, PASCOAG, have fitted up a Tin shop in the rear of their store.

Texas.

That in a large fire at HOUSTON on the 19th inst. the Hardware establishment of C. W. Allsworth was destroyed. Loss, \$30,000; insurance, \$20,000.

That Thomas Bros.' Hardware store, at PARIS, was destroyed by fire a short time since. The loss is estimated at \$3000.

That the firm of Adams & Odle, at MERIDIAN, has changed hands, the successors being M. S. Greer and I. H. Estes.

That Jacob Hollingsworth's Hardware store, at TEMPLE, was burglarized on the 17th inst. Several hundred dollars' worth of Pistols, Guns, Knives, Razors, Silverware, &c., were stolen.

That on the 15th inst. Burrows Bros., ROCKPORT, sustained a total loss by fire of their house and stock. Loss on house, \$1800; on stock, \$6000. Insurance on building, \$800; on stock, \$2000. The firm expect to resume business again soon.

Vermont.

That Michael Holland has opened a new Hardware store at POULTNEY. He will also conduct a tin shop.

That Seneca Place is soon to open a Hardware store at ESSEX JUNCTION.

Washington.

That H. M. Cutler has retired from the Centralia Hardware Company, at CENTRALIA.

Wisconsin.

That the Lowell Hardware Company, JONESVILLE, have purchased the Holloway & Johnson stock. This makes the twelfth stock of Hardware that the company have purchased this season.

The Hardware trade throughout the country are requested to report business changes, improvements and other matters of trade interest suitable for mention in this department.

Paints and Colors.

It should be understood that the prices quoted in this column are strictly those current in the wholesale market, and that higher prices are paid for retail lots. The quality of goods frequently necessitates a considerable range of prices.

White Lead.—The market is in a chaotic state. Conditions are such that it seems impossible to form any combination or agreement that will obstruct the natural bearings of the inevitable law of supply and demand. Home producers outside of the national combine fail to agree and Europeans are on the alert to secure desirable business that may come within their reach. Domestic Dry Lead is secured readily at 4 1/4¢, and rumor has it that concessions are quite frequently made when

chances come up for securing orders involving 25 tons or more. The sharpest competition, however, is in Lead in Oil, in foreign, so-called inferior domestic and the product of the National Company. List prices for domestic are unchanged but discounts to large buyers are very liberal. It is stated that the basis of 5¢ net cash has been quoted from some quarters to capture orders for round lots. Foreign brands have been offered at 5½¢ @ 5¾¢ for future shipment, but 5½¢ upward is generally asked for lots of 50 tons or more. It is rumored that the National Company will ere long issue a brochure giving analyses of foreign Lead offered in this market, but the rumor savors strongly of fiction.

Red Lead.—There is not much if anything doing outside of routine business. Supplies of both foreign and domestic are quite sufficient for the demand. In any event orders are filled promptly at old prices. For future shipment there are offers of foreign at 5½¢ and it is understood that American makers will meet that price where orders are worth competing for. Upon the whole the market looks rather weak.

Litharge.—In the low grades the competition is keen and orders for lots of 25 tons or more are placed with little difficulty at 4½¢, while smaller wholesale quantities are secured at 4¾¢ @ 4½¢. Job lots bring some premium. The finer grades used in the paint trade are also somewhat irregular in price, but have undergone no positive change the past week. Business in these has been only fair.

Orange Mineral.—A dull market has been experienced, although seemingly attractive inducements were occasionally put out to attract orders for foreign brands for future shipment. Upon the whole, prices as quoted for publication stand just about as they were a week ago. On the domestic brands no change of importance has taken place.

Zincs.—Large buyers are going slower than usual in the matter of placing orders for American Oxide, for the reason, as they explain, that there is more to gain than to lose by so doing. Producers have indirectly offered some inducements, but the concessions were not broad enough to be attractive, and only conditional orders for future deliveries have been placed. While apparently rather weak, prices show no decided change. Large buyers are quite as backward about taking up foreign brands at the prices asked, and the tone of the market is easy.

Colors, &c.—There is no distinctly new feature to report in the market for any of the leading lines of dry colors. Trade is fair for the season and prices show nothing more than ordinary fluctuation. Metallic and ready mixed Paints are moving rather slowly.

Oils and Turpentine.

Linseed Oil.—The condition of the market is unchanged. Buyers have purchased in routine way only, sellers have maintained the position that was general a week ago, and merely routine business has taken place. The friction that still crops out at interior points has no perceptible influence here. Prices have remained stationary in the local market.

Cotton Seed Oils.—A fairly large business has been effected, nearly all for home account. Early in the week an advance of 1¢ @ 1½¢ was paid in remote instances, but values subsequently receded to the basis of 25¢ for prime Crude and 30½¢ @ 31¢ for prime Summer Yellow. The reaction was attributed to falling off in export inter-

est and weaker condition of the lard market.

Lard Oil.—Prices have weakened somewhat under the influence of depression in the market for raw material. Prime city makes went at 54¢ @ 55¢, and some outside makes, represented as being quite as good, were placed at even lower figures. At present the market is in somewhat irreg-

ular shape, and business is hardly up to the average.

Fish Oils.—No movement of importance has taken place in the market for crude Menhaden, Sperm or Whale Oils, and former prices are generally named for the pressed and bleached products. In the latter lines trade has been very fair, but not above the average for this season of the year. Cod Oils have been

In the pattern shown they are producing Tea, Dessert, Table, Coffee, Orange and Five o'Clock Tea Spoons, Sugar Shells, Dessert and Medium Forks and Butter Knives. They are put up in dozens or in sets, singly and in combinations in fine lined cases. The marketing of the entire output of these goods is controlled jointly by the manufacturers and by The Fairbanks Com-

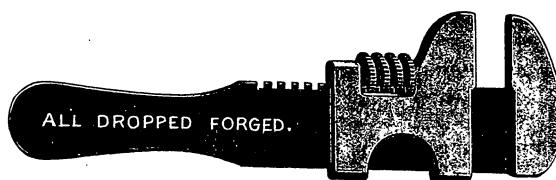


Fig. 1.—Bicycle Wrench.



Fig. 2.—Width of Wrench.

rather more freely offered, and prices are, if anything, a shade easier.

Spirits Turpentine.—Prices have fallen about 1¢ @ gallon. Sales have been made at 27½¢ @ 28¢, as to style of package. The turn has led to the closing of some deferred business in which good sized lots were involved, but outside of that only a very ordinary business has been effected. Stocks in first hands here and at Southern ports are quite heavy all told, aggregating about 35,000 barrels.

Bicycle Wrench.

Hulbert Brothers & Co., 26 West Twenty-third street, New York, are placing a new wrench on the market, as shown in the accompanying illustrations. The wrench is two inches longer than the cut shown in Fig. 1, while Fig. 2 represents its exact size, as far as the width of the wrench is concerned. It weighs 3½ ounces, although, it is stated, it is as strong as the company's last year's wrench, which weighed more than twice as much. It is explained that the wrench has a quick action; that it is made entirely of forged steel, and that it is well adapted to carrying in a vest pocket on account of its narrowness and lightness. The company remark that it is the best wrench they have ever gotten out for the bicycle trade, and also for manufacturers of all kinds of light machines, sewing machines, scroll sawers, &c.

Gold Aluminum Flat Ware.

The Holmes & Edwards Silver Company, 2 Maiden Lane, New York, are manufacturing an improved quality of flat ware for table use, as here illustrated. The metal of which these goods are made is a new alloy, known as gold aluminum, containing none of the baser



Rialto Pattern Gold Aluminum Tea Spoon.

of the first patent of an invention issued in America. It was granted by the General Court in Boston, on March 6, 1646, to Joseph Jenkes, for a water wheel of his invention.

The New Rochester Lamp.

The Rochester Lamp Company, 42 Park place and 37 Barclay street, New

made independent of the remainder of the burner, and lifts up so as to expose the wick, which can be easily lighted from under the chimney holder. Provision

wick sleeve is made in two longitudinal sections, hinged together near the lower end of the sleeve. Around the top edge of each section are points for



Fig. 1.—Chimney Lift.

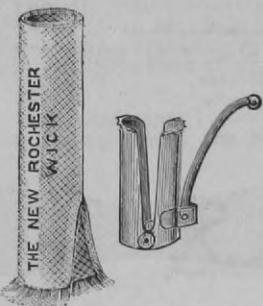


Fig. 2.—Wick and Wick Sleeve.

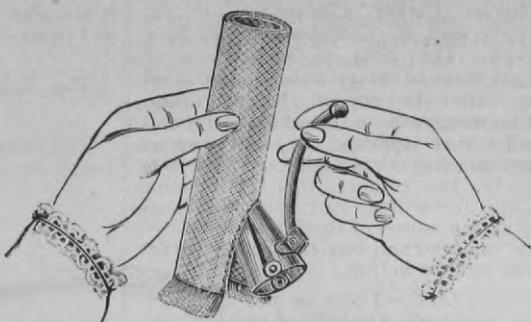


Fig. 3.—Putting on the Wick.

York, are placing upon the market a lamp embodying the improvements illustrated in the accompanying cuts. Fig. 1 shows the new chimney lift, so

is also made for locking the top part of the burner up, so that it will remain in position with the wick exposed until lighted, when it can be dropped into

holding the wick. In putting on a new wick the sleeve is closed at the top, as shown in Fig. 3.

The wick is then slipped over the sleeve, and as the sleeve is slipped over the central draft tube with wick surrounding it, the sections of the sleeve expand and the points at once enter the wick and firmly hold it in place, as shown in Fig. 4. The wick is lowered into the lamp and the burner screwed on in position. Fig. 5 shows the New Rochester stock lamp, with the inside mechanism clearly represented. It will be noticed that the per-

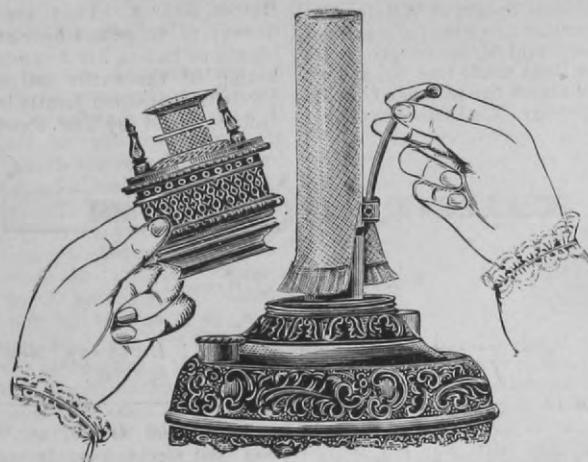


Fig. 4.—Wick in Place.



Fig. 6.—Table Lamp with Handles.

called, on the lamp. By this device the lamp can be lighted without taking off the chimney. The whole top part of the burner, which holds the chimney, is

place ready for burning. Another improvement in the lamp is the draw bar or wick lift. This is shown, with the wick, outside of the lamp, Fig. 2. The



Fig. 5.—New Rochester Stock Lamp.

forated cone burner has a double deflector. The cone slips over the outside of the air tube, thus preventing any weeping—a technical term to designate the siphoning out of the oil over the top and down the inside of the air tube. In Fig. 6 is shown one of the popular styles of the New Rochester table lamp, with handles.

The New Rochester is made in a large number of different designs, but all having the same burner. This lamp is now made under the direct supervision of the Rochester Lamp Company, at Bridgeport, Conn., and an exceedingly full line of samples is displayed at their capacious salesrooms in New York.

Parker's Victor One-Pound Mill.

The cut here shown is of a 1-pound coffee mill, put on the market by The Charles Parker Company, Meriden, Conn., and 97 Chambers street, New York. The body of the mill is of light wood in natural finish, surmounted by metal in copper bronze finish. The receptacle to receive the ground coffee is of japanned tin, resting on an arm attached to the door, so that it is

work as screw hooks do when screwed in securely. The hooks are furnished in Japan, chestnut bronze, and tin plate, the chestnut bronze being referred to as the best seller. The goods, it is stated, are packed in neat boxes and in new cases.

The Samson Steel Tube Sleigh Runner.

The Samson Steam Forge Company, Sacramento street and Carroll avenue,



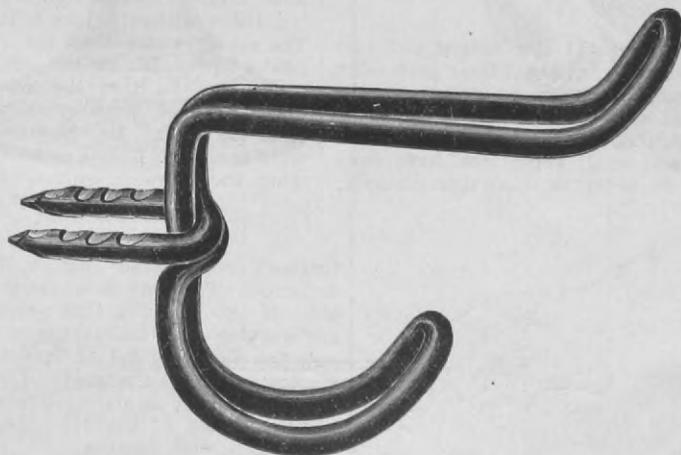
Parker's Victor One-Pound Mill.

drawn forward when the door is opened. The hopper is of a size to contain a pound of unground coffee. The manufacturers remark that the mill is a rapid grinder; that it is well made throughout, and that it is attractive in appearance.

D. T. Wire Coat and Hat Hook.

American Wire Goods Company, Lowell, Mass., are offering a coat and hat hook, shown herewith. The hook

Chicago, have brought out an ingenious and cheap device for converting a buggy into a cutter in very few minutes. It consists of sleigh runners made of steel tubes. Separate runners are made for the two sides. All that is necessary is to remove the buggy wheels, insert the ends of the axles into sleeves or boxes attached to the runners, tighten up nuts and the buggy is a cutter. The box on the front of the runner is dropped lower than that for the rear axle so as to preserve the level of the buggy. The front box is also adjustable to suit carriages



D. T. Wire Coat and Hat Hook.

is made of No. 9 steel wire, and is driven in place. The manufacturers explain that the hooks are put up very quickly; that they hold securely; that they cannot work loose or be stolen, and that they do not mark the surface of the wood

of different lengths. The boxes are lined with rubber to absorb sudden jars. The runner, being a tube, is very strong and light. The manufacturers also state that it will not cut through the snow, thus enabling the driver to take

advantage of a slight fall of snow for sleighing. Other sizes are made for milk, bakery and delivery wagons. Descriptive circulars are issued by the company.

The Iceland Freezer.

The accompanying cut represents an entirely new freezer put on the market

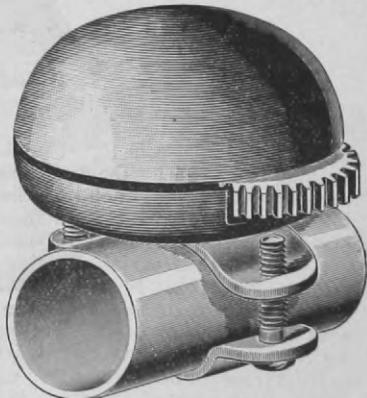


The Iceland Freezer.

for the season of 1894-95 by the Peerless Freezer Company, Cincinnati, Ohio. It is explained that the tub and can are of similar quality as their Peerless freezers, and that the dasher is what is known as the leaf form with a wood scraper attachment. The tops and bottoms of the cans are composed of iron heavily galvanized, obviating, it is remarked, liability of their becoming dented or becoming filled with pin holes, as is apt to be the case with the ordinary tin tops and bottoms. The gearing is completely covered above and below, concealing it from view, insuring cleanliness and adding to the appearance of the freezer. The company state that important improvements have also been made on their line of Peerless freezers.

Midget Bicycle Bell.

The cut here shown represents a new bicycle bell for 1895, put on the market by the New Departure Bell Company, Bristol, Conn., for whom John H.



Midget Bicycle Bell.

Graham & Co., 113 Chambers street, New York, are agents. The cut shows the bell full size, it being 1½ inches in diameter, weighing 3 ounces. The ringing is accomplished by revolving the cogged wheel which is seen at the side, this being so arranged as to give a single, double or continuous ring. The bell is attached to the bicycle by clips and set screws. The rotary or continuous ring, together with the size and weight of the bell, are referred to by the manufacturers as its principal features.

Pressed Steel Fence Posts.

The Avery Stamping Company, Cleveland, Ohio, are introducing fence posts pressed from steel, as shown herewith. The posts are made from sheet steel pressed into shape and are then coated with a non-corrosive compound to prevent rust. The posts taper, being 1

inch narrower at the top than at the bottom, as shown by the figures in the cut, their form being such, it is stated, as to give them great rigidity. The posts are designed to be driven into the ground, thus saving digging and filling. The point is made that frost does not raise them as may be the case with other kinds of posts. For fastening wires to the posts staples are inserted through the holes and bent as shown at the top of the cut, which is referred to as a simple mode of fastening and as allowing the wires to expand and contract. It is pointed out that the posts being light, and nested for shipping purposes, a great saving is made in freight, carriage and handling, and that the price at which they are sold is a noticeable feature of the goods. The posts are made in four sizes, Nos. 1, 2, 3 and 4, and are particularly adapted to use for railway, farm, lawn, park and cemetery fences, whether of smooth barbed or of woven wire. The company state that they have been experimenting for a long time to see if they



Pressed Steel Fence Posts.

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which increased the weight and cost unnecessarily, and that these posts offer the same resistance to pressure in the ground as a wooden post of like size. It is further explained that bar iron and pipe and small angle iron have been used in order to make them cheaply,

Corrugated Ash Can.

Illustrated herewith is a corrugated ash can put on the market by the E. E. Souther Iron Company, St. Louis, Mo. The can is hexagon in shape, and this feature is claimed by the manufacturers to be a valuable one, as it absolutely prevents denting, no matter how hard the usage the can is obliged to stand. It is pointed out that as the can is made of galvanized corrugated iron this renders it practically indestructible, and that with ordinary usage it will last



Corrugated Ash Can.

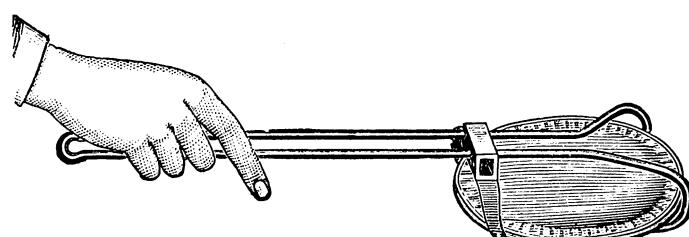
a lifetime. The handles are securely fastened, and the entire can is made unusually strong.

Aluminum Coffee Pot.

Sidney Shepard & Co., 23 Randolph street, Chicago, have brought out an addition to their line of aluminum ware in the form of a coffee pot. It is a beautiful piece of work, the entire body being spun from one piece of metal so that it is without a seam, except at the spout. The design is artistic, in no way resembling coffee pots made of ordinary tin plate. The samples of aluminum ware now shown in the salesroom of this firm make an exceedingly attractive display.

The Safety Grip Lifter.

The Safety Grip Lifter shown herewith is made in two pieces; 4-inch steel wire bent to shape, forming the front arms and handle, upon which the back arms, made of cast iron, readily slide. The lifter is designed to remove hot dishes without injury to the hands. The maker states that the lifter will hold a bowl, plate or dish, either round or square, and that the article to be moved cannot possibly detach itself from the lifter. In operation the forward arms are placed under the plate, when the movable back arms are slid



The Safety Grip Lifter.

but they have been of such small size that they were easily pushed over and an extra plate and bracing had to be used, which made them expensive.

forward until a firm hold is obtained. The Lifter is offered by George W. Hobbs, 111 Main street, Charlestown, Mass.

Chisels—	
Socke Framing and Firmer	
Mix	
Ohio Tool Co. 75x10@80%	
Witherby.	
Buck Bros. 30%	
Charles Buck. 30%	
Douglas. 75@75&10%	
Merrill. 60x10@60&10%	
L. & I. J. White. 30@30&5%	
Tanged and Miscellaneous	
Buck Bros. 30%	
Charles Buck. 30%	
Butchers' \$4.75@5.00 to 2	
Spear & Jackson's. 50 to 2	
Tanged Firmer. 50@50&10%	
L. & I. J. White, Tanged. 25&5%	
Cold Chisels, fair quality, \$ 14@16%	
Chucks—	
Beach Pat. each \$8.00. 20%	
Danbury, each \$6.00. 30@30&5%	
Graham Patent. 39@40	
Morse's Adjustable, each \$7.00. 20@20&5%	
Syracuse, Balz Pat. 25%	
Skinner Patent Chucks:	
Combination Lathe Chucks. 40%	
Drill Chucks. 25%	
Independent Lathe Chucks. 40%	
Planer Chucks. 20%	
Universal Lathe Chucks. 40%	
Union Mfg. Co.:	
Combination. 40%	
Independent. 40%	
Universal. 40%	
Victor, \$8.50. 25%	
Churns—	
McDermaid Star Barrel Churn, each 6 gal. \$2.60; 10-gal. \$2.75; 15-gal. \$3.00; 20 gal. \$3.25.	
Timn Union, each 5-gal. \$3.25; 7-gal. \$3.75; 10 gal. \$4.25.	
Clamps—	
Adjustable Cincinnati. 25&10%	
Adjustable, Hammers'. 15@15&5%	
Adjustable, Stearns'. 30@30&5%	
Barnes' Malleable Screw and Cabinet. 50%	
Barnes' Machinists' Clamps. 33@35	
Cabinet, Sargent's. 70@10%	
Carpenters' Cincinnati. 25&10%	
Carriage Makers' P. & W. Co. 40&10%	
Carriage Makers' Sargent's. 75@5&5%	
Eberhard Mfg. Co. 40&50@40&5%	
Johns' Clamps, Tatums'. 25&10%	
R. I. Tool Co.'s Wrought Iron. 25%	
Saw Clamps, see Vises, Saw Fliers'.	
Stearns' Malleable, with Wrought Iron Screw. 75@75&5%	
Stearns' Steel. 25%	
Warner's. 40&10@40&10@5%	
Cleavers, Butchers'—	
Beatty's. 40&5@40&10%	
Bradley's. 25@30%	
Foster Bros. 30%	
New Haven Edge Tool Co.'s. 40%	
Nichols Bros. 30%	
P. & S. W. 33@5&5@33@10%	
Schulte, Lohoff & Co. 40@40&5	
L. & I. J. White. 25%	
Clips—	
Baker Axle Clips. 25&10%	
Norway Axle. 70@70@5%	
Norway Spring Bar Clips. 60@10@10@70%	
22 grade Norway Axle. 70@50@70@8%	
Steel Fellos Clips. \$ 4@4@4	
Superior Axle Clips. 70@70@5%	
Wrought Iron Fellos Clips. \$ 4@4@4	
Cloth and Netting, Wire	
—See Wire, &c.	
Cockeyes—	50%
Cocks, Brass—	
Hardware list (Globe, Kerosene, Lever Bibbs, Rocking, &c.). 60@10@2%	
Coffee Mills— See Mills, Coffee.	
Collars, Dog—	
Brass, Pope & Stevens' list. 40%	
Chapman Mfg. Company, new list. 40%	
Embossed, Gilt, Pope & Stevens' list. 30@10%	
Leather, Pope & Stevens' list. 40%	
Medford Fancy Goods Co. 40@10@50%	
Combs, Curry—	
American Curry Comb Co. 33@40%	
Fitch's. 50@10@50@10@10%	
Gibb's Magnetic. \$ 20 to \$2.00	
Kohler's Humane. \$ 20 to \$1.75	
Mohler's Magic Oscillating. \$ 20 to \$2.00	
Rubber, \$ doz. \$7.50. 20%	
Compasses, Dividers, &c.—	
Compasses, Callipers, Dividers, 70@10@75%	
Bens & Call Co.'s:	
Dividers. 65%	
Call's Patent Inside. 55%	
Calipers, Double. 65%	
Calipers, Inside or outside. 65%	
Calipers, Wing. 60%	
Compasses. 50@5%	
Excelsior. 50%	
Starrett's. 50%	
Combination Dividers. 25%	
Lock Calipers and Dividers. 25%	
Spring Calipers and Dividers. 20@10%	
Stevens & Co.'s. 25@10%	
Coolers, Water—	
S. S. & Co. 2-gal. \$5.40; 3-gal. \$4.00; 4-gal. \$4.50; 6-gal. \$5.60 each. 60%	
Coopers' Tools—	
See Tools, Coopers'.	
Cord— S-s-h	
Braided, Crown Drap and Fancy, \$ 55@.	
Braided, Crown White, \$ 50@. 30%	
Cable Laid Italian Sash. \$ 19@20%	
Common. \$ 19@20%	
Common Russia Sash. \$ 12@20%	
Egyptian, India Hemp, Braided. 20%	
India Cable Laid Sash. \$ 11@20%	
Massachusetts White. 21@22%	
Ossawam Mills:	
Crown, Solid Braided White. \$ 19@20%	
Crown, Drap and Fancy. \$ 19@20%	
Braided Giant, Drap and Fancy. \$ 19@20%	
Braided, Giant, White. \$ 19@20%	
Patent, good quality. \$ 10@11@	
Patent Russia Sash. \$ 13@14@	
Samson:	
Braided, Drap Cotton. \$ 19@20%	
Braided, Italian Hemp. \$ 19@20%	
Braided, Linen. \$ 19@20%	
Braided, White Cotton. \$ 19@20%	
Semper Idem, Braided, White. 20@10%	
Silver Lake:	
A quality, Drap. 55@.	
A quality, Drap. 50@.	
B quality, Drap. 35@.	10%
B quality, White. 30@.	10%
Sylvan Spring, Extra Braided, Drap. 33@	
Sylvan Spring, Extra Braided, White. 34@	
Tate's Solid Braided:	
Economy, Drap. \$ 27@	
Economy, White. \$ 22@	
Hercules, Drap. \$ 30@	
Hercules, White. \$ 25@	
White Cotton Braided, fair. \$ 19@20@24@	
Wire Picture—	
Braided or Twisted. 80@10@80@20%	
Corkscrews— See Screw, Cork.	
Corn Knives and Cutters	
—See Knives, Corn.	
Crackers, Nut—	
Acme. \$ 25@	
Japanned, \$ gr. \$30. 50@	
Nickel Plated, \$ gr. \$30. 50@	
Fancy Nickel Plated, \$ gr. \$30. 40@	
Table (H. & B. Mfg. Co.). 50@	
Turner & Seymour Mfg. Co. 50@	
Cradles—	
Grain. 50@25@50@5@22@	
Crayons—	
White Crayons, \$ gross. 6@8@2@	
Cases, 100 gr. \$3.75@4.25, at factory.	
D. M. Stewart Mfg. Co.:	
Metal Workers' \$ gr. \$2.50. 20@25@	
Railroad. \$ gr. \$2.00. 20@25@	
Rolling Mill. \$ gr. \$2.50. 20@25@	
Soapstone Pencils, \$ gr. 1.50. 20@25@	
See also Chalk.	
Creamery Pails— See Pails, Creamery.	
Crow Bars— See Bars, Crow.	
Curry Combs—	
See Combs, Curry.	
Cutters— Meat—	
American. 30@	
Nos. 1 2 3 4 B 5	
Each. \$ 5.75 \$ 7 \$ 10 \$ 25 \$ 50 \$ 80	
Enterprise. 25@	
Nos. 10 12 22 32 42	
Each. \$ 8.25 \$ 10 \$ 15 \$ 25 \$ 40	
Dixon's, \$ doz. 40@40@5@5@	
Nos. 1 2 3 4	
\$14.00 \$17.00 \$19.00 \$30.00	
Draw Cut, each:	
Nos. 5 6 8	
\$50 \$75 \$80 \$225 20@25@	
Hale's, \$ doz. 70@70@5@	
Nos. 11 12 13	
\$27.00 \$33.00 \$45.00	
Home No. 1, \$ doz. \$26.00. 55@10@	
Little Giant, \$ doz. 40@10@50@	
Nos. 305 310 312 320 322	
\$35.00 \$48.00 \$44.00 \$72.00 \$86.00	
Miles' Challenge, \$ doz. 45@45@1@1@	
Nos. 1 2 3	
\$22.00 \$30.00 \$40.00	
Triumph No. 505, \$ doz. \$21.00. 25@30@	
Woodruff's, \$ doz. 40@40@5@5@	
Nos. 100 150	
\$15.00 \$18.00	
Chadborn's Smoked Beef Cutter, \$ doz.	
\$60.00	
Enterprise Beef Shavers. 20@	
Tucker & Dorsey Mfg. Co.:	
Kraut Cutters. 40%	
Saw Cutters, 1 Knife, \$ gr. \$21.00	
Saw Cutters, 2 Knife, \$ gr. \$30.00	
Tobacco—	
Acme, \$ doz. \$20.00. 40%	
Al Iron. \$ doz. \$4.00	
Champion. 20@20@10@	
Nassau Lock Co. s, \$ doz. \$18.00. 50@55@	
National, \$ doz. \$1.00. 30@	
Sargent's, \$ doz. \$24.00. 60@60@10@	
Tatum's. 25@10%	
Slaw and Kraut—	
Tucker & Dorsey Mfg. Co.:	
Kraut Cutters. 40%	
Slaw Cutters, 1 Knife, \$ gr. \$21.00	
Slaw Cutters, 2 Knife, \$ gr. \$30.00	
Tobacco—	
Acme, \$ doz. \$20.00. 40%	
Al Iron. \$ doz. \$4.00	
Champion. 20@20@10@	
Nassau Lock Co. s, \$ doz. \$18.00. 50@55@	
National, \$ doz. \$1.00. 30@	
Sargent's, \$ doz. \$24.00. 60@60@10@	
Tatum's. 25@10%	
Enameling and Tinning	
Ware— See Ware, Hollow.	
Escutcheon Pins—	
—See Pins, Escutcheon.	
Escutcheons—	
Brass Thread. 60@60@10@	
Door Lock. Same dis. as Door Locks.	
Wood. 25@	
Expanded Metal—	
List No. 5.	
Door Mats, Galvanized. 25%	
Fencing, Painted Sheets. 20%	
Laathing. 10%	
Netting, Painted Sheets. 20%	
Tree Guards, Paned. 15%	
Window Guards, Paned. 15%	
Extractors, Lemon Juice—	
—See Squeezers, Lemon.	
Fasteners, Blind—	
Austin & Eddy, \$ gr. sets. 55@	
Mackrell's, \$ doz. \$1.00. 20@20@10@	
Security Gravity. \$ gr. \$7.50	
Van Sand's Old Pat. \$15 \$ gr. 55@10@	
Zimmerman's. 50@	
Faucets—	
B. & L. B. Co.:	
West's Lock, Open and Shut Key. 50%	
Burnside's Red Cedar. 50%	
Burnside's Red Cedar, bbl. lots. 50@10@	
Cork Lined. 70@70@10@10%	
Fenn's. 40%	
Fenn's Cork Stops. 33@4%	
Frary's Pat. Petroleum. 60@10@	
No Brand, Red Cedar (in bbls.). 50@10@	
Western Pattern, Metal Key. 40%	
No Brand, Metal Key. 60@	
Self Measuring. 60@	
Enterprise. \$96.00. 33@4%	
Lane's. \$36.00. 25@10@	
Star. 60@	
Star, Metal Plug, new list. 40%	
Lockport, Metal Plug, reduced list. 60@	
Drawers, Money—	
Money Drawers. \$ doz. \$18@20@	
Waddell's Improved, No. 1. \$ doz. \$15.00	
Waddell's Improved, No. 2. \$ doz. \$18.00	
Waddell's Comb, Cutlery Case and Alarm Till. \$12.50	
Diggers, Post Hole, &c.—	
Eureka Diggers. \$ doz. \$11.00	
Fletcher Post Hole Augers. \$ doz. \$11.00	
\$36.00. 20@20@10@	
Gem, Improved. \$ doz. \$8.50@9.00	
Gibbs' Columba. \$ doz. \$12.00	
Gibbs' Hustler. \$ doz. \$10.00	
Gibbs' Imperial. \$ doz. \$7.50	
Gibbs' National. \$ doz. \$12.00	
Gibbs' Post Hole Digger. \$ doz. \$12.75	
Kohler's Hercules. \$ doz. \$10.00	
Kohler's Invincible. \$ doz. \$10.00	
Kohler's Little Giant. \$ doz. \$15.00	
Kohler's Champion. \$ doz. \$7.50	
Kohler's Pioneer. \$ doz. \$9.00	
Ryan's. \$ doz. \$18.00	
Sampson. \$ doz. \$94.00. 25@25@10@	
Shimer's Hollow Handle. \$ doz. \$24.00. 50@50@	
Vaughan's Post Hole Auger. \$ doz. \$8.50@9.50	
Dividers— See Compas's.	
Dog Collars— See Collars, Dog.	
Door Checks—	
—See Checks, Door.	
Door Springs—	
—See Springs, Door.	
Drawers, Money—	
Money Drawers. \$ doz. \$18@20@	
Waddell's Improved, No. 1. \$ doz. \$15.00	
Waddell's Improved, No. 2. \$ doz. \$18.00	
Waddell's Comb, Cutlery Case and Alarm Till. \$12.50	
Drawing Knives—	
—See Knives, Drawing.	
Drills and Drill Stocks—	
Automatic Boring Tools. \$1.75@1.85	
Bench Drills, Stearns'. 50@	
Blocksmiths. each \$1.75	
Blacksmiths' Self-feeding each. \$7.50@20@	
Bearth, Bartholomew's, No. 12. \$16.00	
Breast, Miller's Falls, each \$9.00. 25@	
Breast, P. S. & W. 40@10@	
Breast, Wilson's. 30@5@	
Chicopee Automatic Drill. 20@10@	
Goodell Automatic Drills. 40@5@40@10@	
Ratchet, Curtis & Curtis. 35@	
Ratchet, Merrill's. 25@	
Ratchet, Moore's Triple Action. 25@30@	
Ratchet, Parkers. 20@20@5@	
Ratchet, Weston's. 20@20@5@	
Ratchet, Whitney's. 20@20@10@	
Whitney's Hand Drill, Plain. \$11.00.	
Adjustable. \$12.00. 20@10@	
Twist Drills—	
Cleveland. \$ doz. \$10@	
Diamond, W. & B. 5@60	
Graham's Pat. Groove Shank. \$ doz. \$5@	
Morse. \$ doz. \$5@	
Fixtures, Grindstone—	
Moore's. 55@10@	
P. S. & W. Co. 50@10@10@	
Reading Hardware Co. 50@10@10@10@10@	
Sargent's Patent. 70@10@70@10@10@	
Fluting Machines—	
See Machines, Fluting.	
Fodder Squeezers—	
See Squeezers, Fodder.	
Forks—	
Hay, Manure, &c., Asso. List. 70@70@5@2@	
Hay, Manure, &c., Phila. List. 60@60@10@2@	
Plated, see Spoons.	
Frames—	
Red, Polished and Varnished. \$ doz.	
White Vermont. \$ gr. \$9.00@9.50	
Screen, Window and Door—	
Bonanza Window Screens. 50@10@	
Cortland. 40@40@5@	
Empire Fancy Screen Doors. 50@10@	
Phillips' Window Screen Frames. 50@10@5@10@10@	
Porter's Pat. Window and Door Frame. 33@4@10%	
Freezers, Ice Cream—	
American. 60@	
Arctic. 70@	
Blizzard. 70@	
Crown. 60@	
Double Action Crown. 60@	
Gem. 65@	
Giant. 60@	
Good Luck. 65@	
Granite State. 65@	
Keystone, P. D. & Co. each \$1.50. 20@	
Model. 60@	
Ohio. 60@10@	
Peerless. 60@10@	
Shepard's Lightning. 65@	
Standard. 60@	
Standard Double Action. 60@	
Star. 60@	
White Mountain. 60@	
Zero. 70@	
Fruit and Jelly Presses—	
—See Presses, Fruit and Jelly.	
Fruit Pickers—	
—See Pickers, Fruit.	
Fry Pans—	
—See Pans, Fry.	
Funnels—	
Gersdorff's Perfection, Standard and Globe; Tin, 1 gr. 10%; 2 to 6 gr. 20%; 5 to 10 gr. 30%; Copper, 1 to 6 doz. 15%; 6 to 12 doz. 25%;	
Furnaces, Soldering—	
Burgess, Nos. 3 and 4 Gem, Copper reservoir. 88.50	
Burgess, Nos. 3 and 4 Gem, tin reservoir. 87.00	
Clayton & Lambert, No. 1 Fire-Pot. \$12.00	
\$8.00; No. 2 Fire-Pot. \$12.00</	

Sewing, Pat. Long \$1.20
Sewing, Pat. Short 45@50¢

Halters

Covert's Adj. Rope Halters 40@2¢
Covert's Adj. Web Halters 35@5¢
Covert's Hemp Horse and Cattle Tie 50@10@2¢
Covert's Jute Cattle Ties 70@10@2¢
Covert's Jute Horse Ties 70@2¢
Covert's Rope, 7-16 in., Jute 70@2¢
Covert's Rope, 1/2 in., Hemp 85@2¢
Covert's Rope, Jute 60@10@10@2¢
Covert's Saddlery Works Halters 33@2¢
Covert's Saddlery Works Handy Web Halters 33@4@5¢
Covert's Saddlery Works Horse and Cattle Ties 33@4@5¢

Hammers**Handled Hammers**

Atha Tool Co. { 50@10@60¢
Humason & Beckley { 50@10@60¢
Verree { 50@10@60¢
Cheney's Claw 40@10¢
Cheney's Machinists' & Riveting Tools 50@2¢
C. Hammond & Son 40@10@60¢
Magnetic Tack, Nos. 1, 2, 3, \$1.25, \$1.50 \$1.75
Maydole's '94 list 50@10@40¢
Peck, Stow & Wilcox 25@10@40¢
Fayette R. Plumb 40@10@40¢
Artisans' Choice, A. E. Nall 40@12@2¢
Engineers' and B. S. Hand 60@15¢
Machinists' Hammers 60@10¢
Plain Y. & E. A. Nall 40@12@2¢
Other Nail Hammers 50@10¢
Sargent's 40@10@50¢
Warner & Noble's, new list 25@10@10¢

Heavy Hammers and Sledges

3 lb. and under 25@40¢
3 to 5 lb. 25@80¢ 75@10@80¢
Over 5 lb. 25@80¢
Wilkinson's Smiths' 10¢@10% & 10¢

Handcuffs and Leg Irons

See Police Goods.

Handles**Cross-Cut Saw Handles**

Atkins' 40¢
Champion 45@45@10¢
Ely's Perfection 25@10@80¢
Sensible, 7 doz. Pr. \$5.00 60¢

Iron, Wrought or Cast

Barn Door, P. doz. \$1.40 20@5%
Bronze Iron Drop Latches 25@10@60¢
Chest, Sargent's list. 50@10@50@10@10%
Door or Thumb: Nos. 0, 1, 2, 3, 4 25@10@70%
Per doz. \$0.90 1.00 1.08 1.35 1.50

60@10@10@70%

Jap'd Store Door Handles—Nuts, \$1.62;
Plate, \$1.10; no plate, \$0.88 10@
Boggins' Latches 25@ doz. 28@30¢

Wood

Auger, assorted 25@ \$5.00
Auger, large 25@ \$7.00 50@
File, assorted 25@ \$2.75
Brad Awl 25@ \$2.00
Apple Firmer Chisel, ass'd 25@ \$5.00
Apple Firmer Chisel, large 25@ \$6.00
Hickory Firmer Chisel, ass'd 25@ \$4.50
Hickory Firmer Chisel, large 25@ \$5.00
Socket Firmer Chisel, ass'd 25@ \$3.00
Socket Framing Chisel ass'd 25@ \$5.00
Chisel, Fibre Head 33@2¢
Hammer, Hatchet, Axe, &c. 40@40@2¢
Pax, Rake, Shovel, &c. 60@10@
Pat. Auger, Douglass 25@ \$1.25
Pat. Auger, Ives' 30@10@
Pat. Auger, Swann's 25@ \$1.00
Saw and Plane 40@10@50%
Hangers

Barn Door, New England 70@70@5%
Barn Door, old patterns 70@70@2¢
Barry 25@10@2¢
Best Anti-Friction 60@10@60@10@2¢
Boss 60@10@60@10@2¢
Champion 60@10@2¢
Chicago Anti-Friction 30@10@
Chimax Anti-Friction 55@5@5@5%
Crescent 60@60@10@2¢
Cronk's Patent, Steel Covered 60@10@
Duplex (Wood Track) 60@10@2¢
Economy, \$6.00 50@10@
Hamilton Wrought Steel Track 55@
Interstate 60@60@10@2¢
Kilders' 50@50@10@
Lane's New Standard 50@5@5@5%
Lane's Standard 40@40@4@5%
Lundy Steel Parlor 40@
Magic 50@50@5@5%
Matchless 60@60@5@5%
Moody 45@
Moore's Baggage Car Door 33@2¢
Moore's Elevator 33@2¢
Moore's Railroad 55@
Nickel, Steel, Nos. 0, \$25; 1, \$20; 2, \$15; 40@10@50%
Orleans Steel 55@
Paragon, No. 1, \$3.50; No. 2, \$4.50; No. 3, \$5.50 & doz.
Paragon Parlor 25@ \$2.00
Pendulum, Payson's 40@40@10@2¢
Perfection 50@10@60@10@2¢
Richards' 30@30@10@
Samson Steel Anti-Friction 55@
Star 40@10@40@10@2¢
Stearns' Anti-Friction 20@10@10@
Stearns' Challenge 25@10@10@
Sterling 50@10@60@
Terry's Ideal 50@10@50@10@2¢
Terry's Modern 50@10@60@5@5%
Terry's Shield 50@10@60@
Terry's Solid 50@10@60@
Terry's Wrought Single Strap 50@10@
Victor, No. 1, \$15.00; No. 2, \$16.50; No. 3, \$18.00 50@2¢
Warner's Pat. 20@10@10@
Wild West 50@50@8@
Zenith for Wood Track 55@

Harness Snaps—See Snaps.**Hatchets**

American Axe and Tool Co.:
Blood's 40@ 10@
Hunt's 50%
Hurd's 40@ 10@
Mann's 50%
Underhill's 50%
C. Hammond & Son 10@
Fayette R. Plumb 50%
Collins 10@
Buffalo Hammer Co. 50@ 50@
Kelly's 50%
P. S. & W. Co. 50@ 50@
Sargent & Co. 10@
Schulte, Lohoff & Co. 50@ 50@
Ten Eyck Edge Tool Co. 40@

Hay and Straw Knives

See Knives.

Hinges**Blind Hinges**

Clark's: Nos. 1, 3, 5, 1868, Old Pattern 75@10@5%
Nos. 1 and 3, Tip Pattern 75@10@5%
No. 50, Buffalo Noiseless, 40, 60 and 65 75@10@5%
Buffalo Reversible, Nos. 9, 2, 1 1/2, 1 and 0 70@5@5%
No. 1, Cottage, for wood only 80@10@
No. 1, Diamond, for wood only 80@5@5%
Dixie L. & P., Nos. 3, 2 1/2, 1 1/2, 1 1/2, 4 and 5 75@5%
No. 25, Empire Reversible 75@10@
Lull & Porter, Nos. 3, 2 1/2, 1 1/2, 1, 0, 4 and 5 75@10@5@5%
Mortise Gravity, Nos. 2, 4, 4 1/2, 6, 8, 9 and 10 50@10@5@5%
Huffer 50@10@5@5%
Parker 75@10@5%
North's Automatic Blind Fixtures, No. 2, for Wood, \$9.00; No. 3, for Brick, \$11.50 10@
Reading's Gravity 75@10@75@10@5%
Sargent's, Nos. 1, 3, 5, 11, 12, 13, 15@10@5%
Shepard's: Acme, Lull & Porter, Nos. 3, 2 1/2, 1 1/2, 1, 0, 4 and 5 75@5@5%
Buffalo Gravity Locking, Nos. 1, 3 and 5 80@5%
Champion Gravity Locking, No. 75@10@5%
Clark's or Shepard's 1868, Old Pattern, Nos. 1, 3 and 5 75@10@5%
Clark's or Shepard's Tip Pattern, Nos. 1, 3 and 5 75@10@5%
Double Locking, Nos. 20 and 25 70@5@5%
Empire, Nos. 101 and 103 75@5%
Niagara Gravity Locking, Nos. 1, 3 and 5 80@5@5%
Noiseless, Nos. 50, 60, 65 and 55 75@10@5%
O. Lull & Porter, Nos. 3, 2 1/2, 1 1/2, 1, 0, 4 and 5 75@10@5@5%
Pioneer, Nos. 900, 45 and 55 75@10@5%
Steamboat Gravity Locking, No. 10 80@10@

Gate Hinges

Automatic, 2 doz. \$12.50 50@
Clark's, Nos. 2, 3, 6, 60 and 100, \$6.00 10@5%
N. E. 2 doz. \$7.80 60@30@10@5%
N. E. Reversible, 2 doz. \$5.00 60@60@10@5%
N. Y. State, 2 doz. \$4.90 60@80@10@5%
Shepard's, Nos. 1, 2, 3, 6, 60 and 100 and 105 50@10@5%
Western, 2 doz. \$4.20 60@80@10@5%
Spring Hinges

Acme 30@
American 20@
Bardsley's Patent Checking 15@
Barker's Double Acting 25@
Bonner's Jappanned 35@
Bonner's All other Kinds 30@
Buckman's 15@20@
Champion 60@
Chicago 30@
Columbia 25@
Crown 20@
Devore, No. 1 25@ \$13.00
Freeport 25@ \$12.00
Geer's Spring and Blank Butts 40@
Gem 20@
Ideal No. 3 25@ \$8.00
J. G. C. Covered, 2 gr. \$30 50@5@5%
New Idea, 2 gr. \$10.00 50@5@5%
New Idea No. 2 25@ \$18.00 60@
New Ideal, 2 doz. \$1.20 60@
No. 10 Matchless 60@
No. 25 Unbreakable 60@
Oxford 20@
Reflable 20@
Rex 25@ \$18.00 60@
Royal 60@
Samson 60@60@4@5%
Stearns' Noiseless Floor Hinge, 2 in. 25@ \$5.00 20@10@80@
Surprise 25@ \$12.00 25@
Union Mfg Co. 25@
Union Stirling Hinge Co.'s, list 25@
March '94 20@
Wiles' No. 1, 2 gr. \$16; No. 2, \$13@13@
Wrought-Iron Hinges

Strap and T, list May 60@10@10@
Corrig'd Str'p and T, 22, '94 60@10@10@5%
Plate Hinges, 8, 10 and 12 in., 25@10@5%
Providence, over 12 in., 25@10@5%
Rolled Blind Hinges, Nos. 32 and 34 50@10@
Rolled Blind Hinges, Nos. 232 and 234 50@10@
Rolled Plate 55@10@
Rolled Raised 70@10@
Screw Hook and Eye 25@10@5%
Screw Hook and Eye 25@10@5%
Strap 22 to 36 in., 25@10@5%

Extra 5@10@5% given on many of these Hinges.

Hoes**Eye**

Scovil and Oval Pattern 50@10@60@
D. & H. Scovil 20@30@
Grub 60@10@
Lane's Crescent, Planters' Pattern 45@5%
Lane's Razor Blade, Scovil Pat 30@5%
Handled—
Garden, Mortar, &c. 70@70@5@5%
Magic 25@10@10@
Sterling 50@10@60@
Terry's Ideal 50@10@50@10@5%
Terry's Modern 50@10@60@5@5%
Terry's Shield 50@10@60@
Terry's Solid 50@10@60@
Terry's Wrought Single Strap 50@10@
Victor, No. 1, \$15.00; No. 2, \$16.50; No. 3, \$18.00 50@2¢
Warner Hoe 60@60@5@5%
Hog Rings and Ringers

See Rings and Ringers.

Holisting Apparatus

See Machines, Hoisting

Hollow-Ware

See Ware, Hollow.

Holders

Bag—
Sensible Bag and Twine 50@
Sprengle's Pat., 2 doz. \$18.00 60@
Bit—
Angular, 2 doz. \$24.00 40@5@5%
Extension, Barber's, 2 doz. \$15.00 40@40@10@5%
Ives, 2 doz. \$20.00 60@5@5%
File and Tool—
Balz Pat., 2 doz. \$4.00 25@
Nicholson File Holders 20@
Sash—
Motley's Adj. Sash, Medium Size, 2 doz. \$1.20 40@

Hooks**Cast Iron**

Bird Cage, Reading 60@10@10@
Bird Cage, Sargent's List 70@
Clothes Line, Sargent's List 50@5@10@
Clothes Line, Moore's 70@
Clothes Line, Reading list 60@10@60@10@5%
Coat and Hat, Moore's 70@
Coat and Hat, Reading 50@10@5@10@5%
Coat and Hat, Sargent's List 50@5@10@5%
Hammock, E. C. Stearns & Co. 2 doz. \$6.00
Harness, Reading list 55@10@5@10@5%
Wire—

Atlas, Coat and Hat 80@10@5%
Bolt 80@10@5@80@10@5%
Handy Hat and Coat 50@10@60@5%
Indestructible Coat and Hat 45@4@5@5%
Steely Ceiling Hooks 50@10@60@5%
Williamson's Bird Cage Hooks, list April '92 40@
Bush 55@60@
Fish Hooks, American 50@
Grass, No. 2, \$2.00; No. 3, \$2.10; No. 4, 30@
Linen 40@10@5%
Nylon's Grass 70@2.25@
Whiffetree, Plate 55@
Bench Hooks—See Bench Stops.

See Wrought Goods.

MiscellaneousBush 55@60@
Fish Hooks, American 50@
Grass 30@
Linen 40@10@5%
Nylon's Grass 70@2.25@
Whiffetree, Plate 55@
Bench Hooks—See Bench Stops.

See Wrought Iron.

Wrought IronCotton 80@10@5%
Cotton Pat. (N. Y. Mallet and Handle W'sks) 30@
Cord and Picture, T. & S. Mfg. Co. 50@
Wrought Staples, Hooks, &c.

See Wrought Goods.

KnobsBardsley's Wood Door, Shutter, &c. 15@
Base, Rubber Tip 70@10@5%
Carriage, Jap., 2 gr. 80¢ 60@10@5%
Door, Mineral 60@65@
Door, Por. Jap'd 60@10@5%
Door, Por. Nickel 60@2.25@
Door, Por. Plated Nickel 60@2.25@
Drawer, Porcelain 60@10@60@10@5%
Hinged Door Knobs 50@
Picture, Hematite 95@5%
Knapp & Cowles 50@10@60@5%
Smith's, 2 doz. Single, \$2; Double, \$3 45@50@
Sensible, Nos. 10, 20, 40 & 60 40@

See Mincing.

Mincing

Am. (2d quality), 2 gr. 1 blade, \$7; 2 blades, \$12; 9 blades, \$18 net

Buffalo Adjustable, 2 doz. \$9.00 88@4@5%
Wire Coat and Hat, Miles', list April '92 50@5@5%
Wire Coat and Hat, Standard, 60@60@10@5%
Bright Wire Goods—See Wire.

See Wrought Iron.

Wrought IronCotton 80@10@5%
Cotton Pat. (N. Y. Mallet and Handle W'sks) 30@
Cord and Picture, T. & S. Mfg. Co. 50@
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Door, Por. Plated Nickel 60@2.25@
Drawer, Porcelain 60@10@60@10@5%
Hinged Door Knobs 50@
Picture, Hematite 95@5%
Knapp & Cowles 50@10@60@5%
Smith's, 2 doz. Single, \$2; Double, \$3 45@50@
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MiscellaneousBush 55@60@
Fish Hooks, American 50@
Grass 30@
Linen 40@10@5%
Nylon's Grass 70@2.25@
Whiffetree, Plate 55@
Bench Hooks—See Bench Stops.

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Door, Por. Jap'd 60@10@5%
Door, Por. Nickel 60@2.25@
Door, Por. Plated Nickel 60@2.25@
Drawer, Porcelain 60@10@60@10@5%
Hinged Door Knobs 50@
Picture, Hematite 95@5%
Knapp & Cowles 50@10@60@5%
Smith's, 2 doz. Single, \$2; Double, \$3 45@50@
Sensible, Nos. 10, 20, 40 & 60 40@

See Mincing.

Mincing

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See Wrought Iron.

Wrought IronCotton 80@10@5%
Cotton Pat. (N. Y. Mallet and Handle W'sks) 30@
Cord and Picture, T. & S. Mfg. Co. 50@
Wrought Staples, Hooks, &c.

See Wrought Goods.

MiscellaneousBush 55@60@
Fish Hooks, American 50@
Grass 30@
Linen 40@10@5%
Nylon's Grass 70@2.25@
Whiffetree, Plate 55@
Bench Hooks—See Bench Stops.

See Wrought Iron.

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Door, Por. Plated Nickel 60@2.25@
Drawer, Porcelain 60@10@60@10@5%
Hinged Door Knobs 50@
Picture, Hematite 95@5%
Knapp & Cowles 50@10@60@5%
Smith's, 2 doz. Single, \$2; Double, \$3 45@50@
Sensible, Nos. 10, 20, 40 & 60 40@

See Mincing.

Mincing

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Buffalo Adjustable, 2 doz. \$9.00 88@4@5%
Wire Coat and Hat, Miles', list April '92 50@5@5%
Wire Coat and Hat, Standard, 60@60@10@5%
Bright Wire Goods—See Wire.

See Wrought Iron.

Wrought IronCotton 80@10@5%
Cotton Pat. (N. Y. Mallet and Handle W'sks) 30@
Cord and Picture, T. & S. Mfg. Co.

Plate.....45%
Romer's Night Latches.....15%
R. & E. Mfg. Co., list Mar. 20, 1889.
Sargent & Co., list July, 1894.60&10@70%
Warner's Burglar Proof. 2 doz.....\$8.00, 50%
Elevator—
Moore's.....\$3.50

Padlocks—

Wrought Iron Padlocks:
British, Graham & Mathes, list Jan. '94.....75%
Mallory, Wheeler Co., list Jan. '94.....75%
Norwich Lock Mfg. Co., list June 10, '91.....50&25%
Russell & Erwin Mfg. Co., list June 10, '91.....50&25%
Sargent & Co., list January 1, '94.....75%
William Wilcox Mfg. Co., list January 1, '94.....75&30%
Ames Sword Co., up to No. 103 incl. 50%
Ames Sword Co. above No. 103.....50&10%
Barnes Mfg. Co.....10@40&10%
Champion Padlock.....40%
A. E. Deitz.....40%
Eagle.....40%
Eureka, Eagle Lock Co. 40&25%
E. T. Fraim's Keystone Scandinavian, 1010 line.....90&50%
120 line.....90&25%
100 line.....65%
50 line.....70@10%
225, 610 and 209 lines.....70%
All other numbers.....50&5%
Horseshoe, 2 doz.....50@50&10%
Hotchkiss.....30%
Nock's.....30%
Romer's Nos. 0 to 91.....30%
Romer's Scandinavian, &c., Nos. 100 to 305.....15%
Scandinavian.....90&50%
Slaymaker, Barry & Co.
No. 1010 line.....90%
No. 41 line.....50%
No. 61 line.....60%
No. 21 line.....70%
No. 109 line.....90&40%
Star.....60%
Yale Lock Mfg. Co.'s.....net prices

Sash, &c.—

Atwell Mfg. Co.....25&33%
Champion Safety, list January, 1893.....70&5%
Clark's No. 1, \$10; No. 2, \$8 2 gr. 33%
Common Sense, Jap'd. and Br'd.....3 gr \$4.00
Common Sense, Nickel Plated.....\$ gr \$10.00
Corbin's Daisy, list Feb. 15, 1886.....70%
Davis Bronze, Barnes Mfg. Co. 60%
Ferguson's.....33%
Fish (Liesch's pat.), No. 100, 2 gr. 8%
No. 105, 2 gr. \$10.....50%
Giant, list Jan. 1892.....70&10%
Hammond's Window Springs.....40%
Hugunin's New Sash Locks.....25&52%
Hugunin's Sash Balances.....25&52%
Ives' Patent.....60&10@50&10&10%
Kempshall's Gravity.....60%
Kempshall's Model.....60@60&10%
Monarch.....50%
Payson's Perfect.....60&10&10%
Reading.....60%&10@60&10&10%
Security.....70%
Universal.....30%
Victor.....60&10@8%
Walker's.....10%
Wolcott's.....60&10&5%
Lumber, Tools—
See Tools, Lumber.

Lustro—

Four-ounce bottles.....2 doz. \$1.75; 2 gross.....\$17.00

Machines.

Boring—

Without Augers. Upright. Angular.
Boss, Carpenters' \$3.50
Boss, Ship Builders' 3.75
Douglas.....5.50 6.75.....50%
Jennings'.....5.50 6.75.50@50&5%
Miller's Falls.....7.50.....25%
Phillips' Patent with Auger. 7.00 7.50
Snell's, Rice's Pat. 5.50 6.75.40&10&10%
Crown's, Rice's Pat. 5.50 6.75.40&10&10%
Crown Hand Fluter, Nos. 1, \$15.00; 2, \$12.50; 3, \$10.00; 4, \$8.25.....35%
Crown Jewel, 6 in.....\$3.50 each, 35%
Domestic Fluter.....each, 1.50
Eagle, 3/4-inch Rolls, \$2.15.....35%
Eagle, 5/8-inch Rolls, \$2.85.....35%
Knox, 4/5-inch Rolls.....\$3.25 each 35%
Knox, 6-inch Rolls.....\$3.60 each 35%
Hoisting

Moore's Anti-Friction Differential Pulley Block.....20%
Moore's Hand Hoist with Lock Brake, 20%
Moore's Rope Differential Pulley Block.....60%
Maris & Beckley (Teal Patent).....30%
See also Blocks.

Hoisting—

Fair and Square.....2 doz \$42.00
Anthony Wayne, 2 doz. No. 1, \$42;
No. 2, \$36; No. 3, \$42.00
Wayne American.....2 doz. \$88.00
Welsel.....2 doz. \$36.00
Western Star, 2 doz. No. 2, \$36; No. 3, \$36.

Mallets—

B. & L. Block Co., Hickory & L. V. 30&10@40%
Fibre Head, Stearns.....33%
Hickory.....20&10@20&10@10%
Lignumvitae.....20&10@20&10@10%

Mattocks—

Regular list.....60&10@10@70%

Measures—

Standard Fibreware, No. 1, peck 2 dozen, \$3.50; 1/2 peck, \$3.00.

Meat Cutters—

See Cutters, Meat.

Menders—

Harness.....2 doz. \$1.75
Hudson's Hose Menders, in set, 2 doz.....86.00
Hudson's Hose Bands.....2 doz. \$1.25
Milk Cans—See Cans, Milk.

Mills—

Box and Side, List, Jan. 1, 1888.60@60@10%
Net prices are often made which are lower than above discount.
American, Enterprise Mfg. Co., list Jan. 17, '93.....20%
National list, Jan. 1, '94.....30%
Swift, Lane Bros. 30%
Waddell's New Box Mills, Ideal Brand, New list, 20@60&10%
Ex. 10@10@10% given

Mincing Knives—

See Knives, Mincing.

Molasses Gates—

See Gates, Molasses.

Money Drawers—

See Drawers, Money.

Muzzles—

Safety.....2 doz. \$8.00, 25%

Nails—

Cut and Wire. See Trade Report.
Wire Nails, Papered.

Association list, May 1, '92.85&10@90%
Hungarian, Finishing, Upholsterers, &c.

See Tucks

Horse—

Nos. 6 7 8 9 10

A. C.25¢ 23¢ 22¢ 21¢ 21¢

American.....9/10 9/4 9/4 9/3 4/10&10%

Anchor.....23/4 21/4 20/4 19/4 13/4.....35%

Usable.....28/4 26/4 25/4 24/4 23/4.....40&52%

Capewell.....19/4 18/4 17/4 16/4 16/4 10&52%

C. B. K.25/4 23/4 22/4 21/4 21/4.....40%

Champion.....25/4 23/4 22/4 21/4 20/4.....10&10@10%

Champlain.....28/4 26/4 25/4 24/4 23/4.....40&52%

Clinton Fin.19/4 17/4 16/4 15/4 14/4 30&52%

Empire Bronzed.....11@11/4

40&10@50%

Essex.....23/4 26/4 25/4 24/4 23/4

Lyra.....9/4 9/4 9/4 9/4 9/4.....net

Maud S.25/4 23/4 22/4 21/4 21/4.....50&10@5%

Northwest'n.25/4 23/4 22/4 21/4 20/4.....25@25&5%

Putnam.....23/4 21/4 20/4 19/4 18/4.....15%

Snowden.....9/4 9/4 9/4 9/4 9/4.....net

Standard.....23/4 21/4 20/4 19/4 18/4.....35%

Vulcan.....23/4 21/4 20/4 19/4 18/4.....25%

Western.....23/4 21/4 20/4 19/4 18/4.....50%

Picture—

Brass Head, Combination List.....50&10%

Brass Head, Sargent's List.....60@60&10%

Porcelain Head, Combination List 40&10%

Porcelain Head, Sargent's List 50&10@10%

Niles' Patent.....40%

Nail Pullers—See Pullers, Nail.

Nail Sets—See Sets, Nail.

Nippers, See Pliers and Nippers.

Nut Crackers—

See Crackers, Nut.

Nuts—List Dec. 18, 1889.

Square, Hex.

Cold Punched.....5/4¢ 5/4¢ off list

Cold Pressed.....6/4¢ 6/4¢ off list

In packages of 100 lb, add 1-10¢ 2 lb, net; in packages less than 100 lb, add 1/2¢ 2 lb, net.

Oakum—

Best or Government.....2 doz. @61/4

Navy.....2 doz. @51/4

U. S. Navy.....2 doz. @51/4@51/4

Oil Tanks—See Tanks, Oil.

Oilers—

Brass and Copper.....50&10@50&10@5%

Zinc and Tin.....70@70&10%

Broughton's Brass.....50%

Broughton's Zinc.....60%

Malleable, Hammers' Improved, No. 1, \$3.00; No. 2, \$4.00; No. 3, \$4.40 @ doz.

10&5%

Malleable, Hammers' Old Pattern, same list.....50%

Olmstead's Brass and Copper.....50%

Olmstead's Tin and Zinc.....60%

Prior's Pat. or Paragon' Brass.....60%

Prior's Pat. or Paragon' Zinc.....70%

Steel, Draper & Williams.....50%

Wilmett & Hobbs Mfg. Co., Steel Anti-Rust.....60%

Openers, Can—

American.....2 doz gross \$1.75@2.00

Champion, 2 doz. \$2.00.....50%

Domestic, 2 doz. \$2.00.....50%

Duplex.....2 doz 25¢ 15@20%

Excelsior, No. 1, \$2.50; No. 2 \$1.50; 40%

French, No. 4, 2 doz \$2.25, 50¢@20%

Iron Handle, No. 5, 2 doz \$6.00, 45¢@60%

Lyman's.....2 doz \$3.75, 25¢

Messenger's Comet.....2 doz. \$3.00, 25¢

Sardine Scissors.....2 doz \$2.75@3.00

Sprague, Iron or Wood Handles.....2 doz. \$4.75@5.00

Star.....2 doz. \$2.75@3.00

Streeter's.....2 doz. \$2.75@3.00

Sensible, Japanned, 2 doz.....60¢

Sensible, Nickel, 2 doz.....75¢

Surprise, 2 doz.....25¢

New Sprague, Metallic H'dle, 2 doz. 50¢

New Sprague, Wood H'dle, 2 doz. 60¢

Universal, 2 doz. \$3.00.....55&5%

World's Best, 2 gross, No. 1, \$12.00; No. 2, \$24.00; No. 3, \$36.00.....50&10%

American Packing.....9¢ @ 10¢ 6 in. 50¢@60%

Inferior quality.....75&10@80%

Extra.....60&5@60&10@80%

Jenkin's Standard, 2 doz. 25¢@25&5%

N. Y. B. & P. Co., Double Diamond.....60¢

N. Y. B. & P. Co., Salamander.....45¢

N. Y. B. & P. Co., Carbon.....70&5%

Packing, Steam—

Rubber—

Standard, fair quality.....70@10@75%

Inferior quality.....75@10@80%

Extra.....60&5@60&10@80%

Italian Packing.....12¢ @ 15¢ 2 lb

Jute.....6¢ @ 7¢ 2 lb 2 lb

Russia Packing.....13¢ @ 14¢ 2 lb

Miscellaneous—

American Packing.....9¢ @ 10¢ 6 in. 50¢@60%

Cotton Packing.....14¢ @ 15¢ 2 lb

Italian Packing.....12¢ @ 13¢ 2 lb

Jute.....6¢ @ 7¢ 2 lb

Russia Packing.....13¢ @ 14¢ 2 lb

Standard, fair quality.....70@10@75%

Inferior quality.....75@10@80%

Extra.....60&5@60&10@80%

Italian Packing.....12¢ @ 15¢ 2 lb

Jute.....6¢ @ 7¢ 2 lb

Russia Packing.....13¢ @ 14¢ 2 lb

Standard, fair quality.....70@10@75%

Inferior quality.....75@10@80%

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Standard, fair quality.....70@10@75%

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Jute.....6¢ @ 7¢ 2 lb

Russia Packing.....13¢ @ 14¢ 2 lb

Standard, fair quality.....70@10@75%

Inferior quality.....75@10@80%

Extra.....60&5@60&10@80%

Italian Packing.....12¢ @ 15¢ 2 lb

Jute.....6¢ @ 7¢ 2 lb

Russia Packing.....13¢ @ 14¢ 2 lb

Standard, fair quality.....70@10@75%

Inferior quality.....75@10@80%

Extra.....60&5@60&10@80%

Italian Packing.....12¢ @ 15¢ 2 lb

Jute.....6¢ @ 7¢ 2 lb

Russia Packing.....13¢ @ 14¢ 2 lb

Standard, fair quality.....70@10@75%

Inferior quality.....75@10@80%

Extra.....60&5@60&10@80%

Italian Packing.....12¢ @ 15¢ 2 lb

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Covert, New R. E.	60 & 10 & 5 & 2%
Fitch's (Bristol)	50%
Fitch's National	50 & 10 & 5%
Fitch's Clipper	60 & 10%
Fitch's Union	60 & 10%
Fitch's Champion	50%
German, new list	40 & 10%
Kelly & Woolworth's <i>vee</i> Harness	50 & 10 & 6%
John Prota Snaps	75 & 75 & 5%
Gargent's Patent Guard	70 & 10 & 10 @ 70 & 10 & 10%
Snaths	50 & 20 & 50 & 10%
Snips, Tinner's —See Shears.	
Soldering Irons	
—See Irons, Soldering.	
Splitters, Cupidors, &c.	
Standard Fiberware	
Cupidors, 8 1/2 inch, 1/2 doz. No. EX.	
Splitters, Daisy, 8-inch, No. 1, 4 1/2 and 11 inch, 50	
Spoke Shaves	
—See Shaves, Spoke.	
Spoke Trimmers	
—See Trimmers, Spoke.	
Spoons and Forks	
Tinned Iron	
Basting, Cen. Stamp. Co.'s list	70 & 25%
Buffalo, S. S. & Co.	85 & 42%
Sold Table and Tea, Cen. Stamp. Co.'s list	70 & 25%
Silver Plated	
4 months or 55 cash 30 days:	
L. Boardman & Son	50 & 12%
Holmes & Edwards Silver Co.	40, 15 & 5%
Meriden Brit. Co., Rogers	40 & 15%
Reed & Barton	40 & 10 & 5%
Rogers & Bros.	40 & 15%
C. Rogers & Bros.	40 & 15%
Rogers & Hamilton	40 & 15%
Wm. Rogers Mfg. Co.	40, 15 & 5%
Simpson, Hall, Miller & Co.	40, 15 & 5%
Miscellaneous	
Boardman's Britannia Spoons, case lots	60 & 24%
Boardman's Nickel Silver, list July 1, 1891	60 & 24 & 25%
Britannia	60 & 60 & 5%
German Silver	50 & 50 & 5%
Nickel Silver	50 & 50 & 50 & 10 & 5% cash
Holmes & Edwards Silver Co.:	
No. 24 German Silver.	50 & 10 & 5%
No. 30 Silver Metal.	50 & 10 & 5%
No. 49 Nickel Silver	50 & 10 & 5%
No. 50 Nickel Silver	50 & 10 & 5%
No. 67 Mexican Silver	50 & 10 & 5%
Rogers & Hamilton:	
Climetar, Flatware	40 & 15 & 5%
Climetar, Steel Goods	40 & 10%
Crown Hamilton, Flatware and Cutlery	30%
Steel Goods	40 & 10%
Wm. Rogers Mfg. Co.:	
18% Rogers' German Silver	60 & 5%
25% Rogers' Nickel Silver	50 & 5%
Rogers' Silver Metal	50 & 10 & 5%
Springs —Door	
Champion (Coll.)	55 & 10 & 55 & 10 & 5%
Cowell's, No. 1, 1/2 doz. \$18.00; No. 2, \$15.00	50 & 50 & 20%
Gem (Coll.), list April 10, 1884	20%
Hercules	50 & 50 & 10%
Phoenix	33 1/2 & 33 1/2%
Rubber, complete, 1/2 doz. \$5.00, 81/2 & 10%	
Star (Coll.), list April 10, 1884	20 & 10%
Torrey's Rod, 39 in.	1/2 doz. \$1.20 & 20%
Warner's No. 1, 1/2 doz. \$1.50; No. 2, \$1.40	55 & 55 & 10%
Victor (Coll.)	60 & 10 & 60 & 10 & 5%
Carriage, Wagon, &c.	
Elliptic, Concord, Platform and Half Borell	
60 & 20 & 60 & 10 & 10 or net prices	
Clift's Bolster Springs	25%
Sprinklers, Lawn	
Gibb's Arc	1/2 doz. \$12.00
Gibb's Hustler	1/2 doz. \$6.00
Squares	
Nickel-Plated	85 & 85 & 85
Steel and Iron	
Try Square and T Bevels	60 & 10 & 10%
Avery's Level Protractor	50%
Avery's Flush Bevel Squares	50%
Diston's Try Sq and T Bevel 50 & 50 1/2	
Starrett's Micrometer Caliper Squares	25%
Winterbottom's Try and Miter	30 & 10%
Squeezers	
Fodder	
Hair's	1/2 doz. \$2.00
Hair's "Olimax"	1/2 doz. \$1.00
Lemon	
Porcelain Lined, No. 1	1/2 doz. \$6.00
	25 & 20%
Wood, Common	1/2 doz. \$1.70 & 1.75
Wood, No. 2	1/2 doz. \$3.00, \$3.50
Dean's. No. 1	1/2 doz. \$5.50; 2, \$3.35; 3, \$1.65; Queen, \$2.50
Dunlap's Improved	1/2 doz. \$2.75, 20 & 1/2
Hotchkiss' Straight Flash	1/2 doz. \$9.67
Jennings' Star	1/2 doz. \$2.50
King	40 & 25%
Little Giant	50 & 50 & 55%
The Boss	1/2 doz. \$2.50
Standard Fiber Ware	
See Ware, Standard Fiber.	
Staples	
Barbed Blind, 1 in. and larger	1/2 doz. \$7.45
Barbed Blind, 1/2 in.	1/2 doz. \$8.25
Fence Staples, Galvanized	Some price
Fence Staples, Plain	See Barb Wire
Grand Crossing Tack Co.'s list	7.62 & 10%
Steaks Butchers'	
O. & A. Hoffmann's	40%
Nichols Bros.	50%
Steelyards	40 & 10 & 50%
Stocks and Dies	
Hackmills:	
Butterfield's Goods	55%
Waterford Goods	55%
Gardiner	55%
Green River	55 & 50%
Lightning Screw Plate	25 & 50%
Loco's New Screw Plates	25 & 50%
Reversible Ratchet	35%
Stone	
Stones, Grind —See Grindstones.	
Scythe Stones —	
Pike Mfg. Co., list April, 1892	23 & 14
Cleveland Stone Co., list Nov. 1892	33 & 14
Oil Stones, &c.	
Pike Mfg. Co.:	
Hindost No. 1, 1/2 doz. \$4	
Sand Stone	50%
Turkey Oil Stone, 4 to 8 in.	40 & 40 & 10%
Turkey Slips	50%
Lily White Washita	60%
Rosy Red Washita	60%
Washita Stone, Extra	60%
Washita Stone, No. 1	40%
Washita Stone, No. 2	30%
Lily White Slips	60%
Rosy Red Slips	60%
Washita Slips, Extra	60%
Washita Slips, No. 1	70%
Arkansas Stone, No. 1, 5 to 8 in. \$2.80	33 & 14
Arkansas Stone, No. 1, 5 to 8 in. \$3.50	33 & 14
Lake Superior	1/2 doz. \$1.84
Lake Superior Slips	1/2 doz. \$2.04
Tanite Mills:	
Emery Oil	1/2 doz. \$9.00, 50 & 65%
Stops, Bench	
Cincinnati	25 & 10%
Crescent	1/2 doz. \$1.50
Hotchkiss	1/2 doz. \$5, 10 & 10 & 10%
McGills	1/2 doz. \$3
Millers Falls	25%
Morrill's	1/2 doz. \$1.00; No. 1, \$1.10
Stevens	40 & 25%
Terrell's	1/2 doz. \$1.00
Weston's	1/2 doz. \$1.10, 8 & 10 & 10%
Wire Brads, Nails, &c.	
Standard Wire, list	50 & 10 & 10%
Excelsior, Special list	20%
Spring	10%
Thermometers	
Tim Case	80 & 80 & 10%
Stearns'	20 & 10%
Terrell's Nos. 1 and 2, 1/2 doz. \$3; No. 3, \$3.60	
Weston's, No. 1, \$1.10, No. 2, \$3.25 & 10 & 10%	
Stove Polish —See Polish, Stove.	
Stretchers, Carpet	
Cast Iron, Steel Points	1/2 doz. \$7.60
Cast Steel, Polished	1/2 doz. \$2.25
Socket	1/2 doz. \$1.75
Bullard's	25 & 10 & 4%
Straps, Razors	
Emerson C. Buff	1/2 doz. \$2.80 & \$3.00
Imitation Emerson	1/2 doz. \$1.25 & \$1.50
Jordan's Pat. Padded, list Nov. 1, '89, 50%	
Lamont Combination	1/2 doz. \$4.00
Stuffer Sausage	
Miles' Challenge	1/2 doz. \$20.00 & \$20.50
Perry	1/2 doz. \$20.00 & \$20.50
Draw Cut No. 4, each \$30.00	20 & 25%
Enterprise Mfg. Co., list Jan. 17, '88, 25%	
Silvers	1/2 doz. \$10.00
Sweepers, Carpet and Lawn	
Carpet	
Aome	1/2 doz. \$26.00
Advance	1/2 doz. \$18.00
Grand	1/2 doz. \$36.00
Gold Medal	1/2 doz. \$27.00
Prize	1/2 doz. \$27.00
Premier	1/2 doz. \$27.00
Superior	1/2 doz. \$27.00
Cosmopolitan	1/2 doz. \$24.00
Furniture Protector, Jap.	1/2 doz. \$27.00
Furniture Protector, Nickel	1/2 doz. \$27.00
Inter Ocean	1/2 doz. \$27.00
Hall	1/2 doz. \$48.00
Crown Jewel, No. 1, \$18.00; No. 2, \$19.00	
Domestic, No. 1	1/2 doz. \$21.00
Domestic, No. 2	1/2 doz. \$22.00
Easy, Jap'd	1/2 doz. \$22.00; Nickel, \$24.00
Excelsior	1/2 doz. \$22.00
Grand Rapids, Japanned	1/2 doz. \$24.00
Grand Rapids, Nickled	1/2 doz. \$27.00
Housewife's Delight	1/2 doz. \$15.00
Improved Parlor Queen, Japanned	1/2 doz. \$24.00
Nickled	1/2 doz. \$27.00
Ladies' Friend	1/2 doz. \$15.00
Ladies' Friend No. 2	1/2 doz. \$16.00
Parlor Queen	1/2 doz. \$24.00
Standard	1/2 doz. \$22.00
Supreme	1/2 doz. \$22.00
Bissell Carpet Sweeper Co. make the following rebates:	
\$1.00 per doz. in 5 doz. lots.	
\$2.00 per doz. in 10 doz. lots.	
Lawn	
Thompson Mfg. Co.	30%
Swings	
Davies' Lawn	25%
Tacks, Brads, &c.	
List October 19, 1889.	Old established straight Weights, Short Weight goods are sold at lower prices.
Cant Tacks	
American, Blued	47 & 5%
American, Tin and Cop'd.	52 & 5%
Steel, Bright and Blued	47 & 5%
Steel, Tinned and Coppered	52 & 5%
Swedes Iron, S. S., Blued	40%
Swedes Iron, S. S., Tinned	47 & 5%
American Iron Tacks, Foreign	50%
Swedes Iron Tacks	
S. S., Blued	37 & 5%
S. S., Tinned	45%
Lanc.	30%
Lanc., Tinned	37 & 5%
Upholsterers' S. S.	47 & 5%
Upholsterers', Lanc.	37 & 5%
Gimp Tacks	
S. S., Blued	30%
S. S., Tinned	42 & 5%
Lanc.	20%
Lanc., Tinned	35%
Basket and Trimmers' Tacks	
Land	20%
S. S.	30%
Common and T Bevels	25 & 20%
Leathered Tacks	5%
Brush Tacks, Nails, S. S.	20%
Looking Glass Tacks, S. S.	20%
Picture Frame Points, S. S.	12 & 5%
Lace Tacks, Blued	10 & 5%
Lace Tacks, Tinned	20%
Finishing Nails	52 & 5%
Truss and Clout Nails	
Blued	52 & 5%
Tinned or Coppered	57 & 5%
Basket Nails	37 & 5%
Chair Nails	35%
Cigar Box Nails	30%
Toe Capped Nails	50%
Shoe Finders' List, April, 1894.	
P. H. Cobblers' Nails	
4 1/2 in. and shorter	1/2 doz. \$20.60
2 1/2 in. and longer	1/2 doz. \$18.85
C. S. Corrugated Brass Nails	1/2 doz. \$16.50
Flat Head Improved Brass Nails	1/2 doz. \$18.50
No. 18, 19 & 19 1/2 & heavier	1/2 doz. \$21.20
2 1/2 & 3 1/2 in. \$40.00	Extra cash
3 1/2 & 3 1/2 in. 51.50	33 & 15
4 1/2 & longer. 41.20	33 & 15
Miscellaneous	
Double Point	85 & 10 & 85 & 10 & 10%
Wire Carpet Nails	60 & 10 & 60 & 10%
Bill Nye Brad Box	1/2 doz. \$1.00
Bonnie Blue	1/2 box \$1.00
Claw Handle Carpet	1/2 box \$1.00
Home Tacks, No. 50	1/2 case (12 cartons), \$72.00
Home Nails, No. 200	1/2 case (12 cartons), \$80.00
Home Nails, No. 400	1/2 case (12 cartons), \$160.00
Parlour Cut Nails, cartoon	50
Woolly Rock Carpet Tacks	20 & 10%
Upholsterers' Nails	50 & 10 & 10%
Trimmers, Spoke	
Bonney's No. 1, 1/2 doz. \$5; No. 2, \$7	
Ives', No. 1, \$15.00; No. 2, \$19.00	
Stearns'	50 & 10 & 10%
Douglas'	1/2 doz. \$9.00, 20 & 10%
Cincinnati	25 & 10%
Trowels	
Brade's Brok	25 & 10 & 10%
Clement & Maynard's	20 & 20 & 10%
Diston's Brk and Plastering	25 & 25 & 10%
Peace's Plastering	25 & 25 & 10%
Reed's Brick and Plastering	25 & 25 & 10%
Rose's Brick	25 & 25 & 10%
Worrall's Brick and Plastering	25 & 25 & 10%
Cleve's Angle Trowel, 1/2 gro. No. 1, \$36	
No. 2, \$30; No. 3, \$18; net 1/2	
Garden	70%
Trucks, Warehouse, &c.	
B. & L. Block Co.'s list	10%
Barnes' Barrel Trucks	40%
Daisy Stove Trucks, Improved pattern	10%
Thomson Mfg. Co.	10%
Tubes, Boiler	
See Pipe	
Twine	
Twine Twine	BO, B.
No. 9, 1/2 and 1/4 1/2 Balls	22 & 24
No. 12, 1/2 and 1/4 1/2 Balls	18 & 24
No. 18, 1/2 and 1/4 1/2 Balls	17 & 24
No. 24, 1/2 and 1/4 1/2 Balls	17 & 24
No. 36, 1/2 and 1/4 1/2 Balls	16 & 19
Chalk Line, Cotton, 1/2 lb. Balls	17 & 20
Cotton Moos, 6, 12 & 15 lb to doz.	15 & 17
Cotton Wrapping, 5 Balls to doz. 13 & 14	
2-Ply Hemp, 1/2 lb. Balls	10 & 10%
3-Ply Hemp, 1/2 lb. Balls	10 & 10%
2, 3, 4 and 5 Ply Jute, 1/2 lb. Balls	8
Mason Line, Linen, 1/2 lb. Balls	64
No. 264 Mattress, 1/2 and 1/4 lb. Balls	52 & 64
Paper	10 & 11%
Wool	54 & 66
Vises	
Solid Box	50 & 10 & 60%
Parallel	
Backus and Union	40%
Bonney's	45 & 50%
Double Screw Leg	15 & 10%
Fisher & Norris Double Screw	15 & 10%
Hollands'	40 & 40 & 10%
Howard's	45%
Massey Quick Action	20 & 25%
Merrill's	15 & 20%
Millers' Falls	40 & 40 & 10%
Moore's	25%
Parker's	20 & 25%
Prentiss	20 & 25%
Sargent's	70 & 10 & 70 & 10 & 10%
Simpson's Adjustable	40%
Stephens'	25 & 30%
Trenton	40 & 5 & 40 & 10%
Saw Fliers	
Bonney's, Nos. 2 & 3, \$15.00	45 & 50%
Cincinnati, Nos. 110, \$10.00	120
Economy	15.00
Hopkins'	50 & 10 & 10 & 10%
Reading	40 & 10%
Stearns' Common, Nos. 1, 2 & 3	50
Stearns' Rubber Jaw, Nos. 10 & 12	38 & 38
Wentworth	20 & 10%
Miscellaneous	
Bauer's Pipe Vise	10%
Cowell Hand Vises	25%
Enterprise Pipe Vises	each \$3.00, 40%
Massey Combination Pipe Vise	40%
Phoenix Vise	85%
Phoenix Hand Vises	each \$3.00, 85%
Wads —Price Per M.	
U.M.C. & W.R.A.—B. E. 11 up	60
U.M.C. & W.R.A.—B. E. 9 to 10	70
U.M.C. & W.R.A.—B. E. 8	80
U.M.C. & W.R.A.—B. E. 7	80
U.M.C. & W.R.A.—B. E. 6, 11 up	80
U.M.C. & W.R.A.—B. E. 5, 7	125
Eley's B. E. 11 and larger	11 & 12
Eley's P. E. 12 to 20	88.00 & 88.50
Wagon Boxes	
See Boxes, Wagon.	
Wagon Jacks	
See Jacks, Wagon.	
Ware, Hollow	
Cast Iron, Hollow	
Stove Hollow Ware	
Ground	60 & 10 & 10 & 70%
Unground	

Silver Plated, Hollow. 4 mo. or 5 1/2 cash in 30 days. Meriden Britannia Co.	Water Coolers— See Coolers, Water.	Galvanised Fence 75¢ to 10¢ Main's An'aled & Tin'd on Spools 60¢ to 85¢ Main's Brass and Cop. on Spools 50¢ to 85¢ Steel Music Wire , 12 to 30, imported 60¢ to 70¢ W. D.	Acme, Nickleated 40¢ to 45¢ Alken's Pocket Bright \$2.50 to \$2.60 Alligator 30¢ to 10¢ Always Ready 85¢ to 10¢ to 10¢
Reed & Barton 40¢ to 100¢ Rogers & Brother 40¢ to 100¢ Simpson, Hall, Miller & Co. 40¢ to 100¢ Harford Silver Plate Co. 40¢ to 100¢ William Rogers Mfg. Co. 40¢ to 100¢	Wedges— Iron W. D. 24¢ to 24¢ Steel W. D. 20¢ to 24¢	Stubs' Steel Wire , 36¢ to 2 to 10¢ Tate's Spooled, Tin'd & Annealed 60¢ to 85¢ Tate's Spooled Cop. and Brass 50¢ to 85¢ Tin'd Broom Wire , 18 to 21, W. D. 40¢ to 50¢ Wire Clothes Line , see Lines. Wire Picture Cord , see Cord.	Adjustable S. 55¢ to 10¢ Brigg's Pattern 40¢ to 10¢ Combination Black 40¢ to 10¢ Combination Bright 40¢ to 10¢ Cylinder or Gas Pipe 45¢ to 10¢ Extra Heavy 45¢ to 10¢ Merrick's Pattern 55¢ to 10¢ No. 3 Pipe Bright 55¢ to 10¢ Bit Wrench Adj. Tatum's \$1.00 to \$2.25
Washers— size hole 5-16 1/2¢ to 10¢ Washers 4.80 3.80 2.55 2.30 In lots less than 2000 lb. add 1/2¢ to 5-1/2¢ boxes 1/2 to 10¢	Weights Sash— Ton lots at factory \$14.00 to \$15.00 Small lots at factory 15.00 to 16.00	Well Buckets Galvanized —See Pails, Galvanized.	Bright Wire Goods— Standard list 90¢ to \$15.00
Washer Cutters— See Cutters, Washers.	Wheels Well— 8 in. \$3.00; 10 in. \$2.50; 12 in. \$2.75	Wire Cloth and Netting— Galvanized Wire Netting 80¢ to \$10 to 10¢ Painted Screen Cloth, 100 ft. \$1.40 to \$1.45	Wire Cloth and Netting— Galvanized Wire Netting 80¢ to \$10 to 10¢ Painted Screen Cloth, 100 ft. \$1.40 to \$1.45
Whips	Per dozen.	Wire Barb— See Trade Report.	Wire Cloth and Netting— Galvanized Wire Netting 80¢ to \$10 to 10¢ Painted Screen Cloth, 100 ft. \$1.40 to \$1.45
American Whip Co.: Length. 4 ft. 8 ft. 6 ft. 6 ft. 7 ft. 7 1/2 ft. 8 ft. X. L. Whalebone Drivin' \$18.00 20.00 22.00 24.00 27.00 30.00 38.00 46.00 Bureka, Two-thirds Whalebone 15.00 16.50 18.00 20.00 Bull Bone, Half-length Whale bone 11.00 12.00 13.00 15.00 American Standard 8.00 8.50 9.50 10.50 12.00 18.50 15.00 16.50 True Grip, Raw Hide Center 6.00 6.00 6.50 7.00 7.50 9.00 New Name, Stocked Java, Black and Wine Colors 6.00 Americus, 98 Pen Whip 6.00 Gents' Light Driving No. 111. 6.00 Gents' Light Driving No. 106. 5.00 Hand-made Stocked Java No. 108 8.75 4.00 A large variety of cheaper grades 50¢ to 45¢ Team Whips 32.00 to 47.50	Wire Barb— See Trade Report.	Wire Rope—See Rope, Wire.	Wringers, Clothes— In lots of less than one dozen. Am. Wringer Co.'s list, July 2, '94. 2¢ cash Colby Wringer Co.'s list, May 1, '94. 2¢ cash Lovel Mfg. Co., list July 2, '94. 2¢ cash Peerless Mfg. Co., list Feb. 1892. 2¢ cash National Wringer & Mfg. Co., list June 1, 1892. 2¢ cash
Toy Whips Hardware Assortment, 10/ American, 75 Whips for \$50.00.	Wire and Wire Goods—Iron Market, Br. & Ann. Nos. 0 to 18. 75¢ to 10¢ Cop'd, Nos. 0 to 18. 75¢ to 10¢ Annealed Wire on Spools 82¢ to 85¢ Brass, list April 9, 1894. 40¢ to 55¢ Cast Steel Wire 60¢ Copper, list Jan. 18, 1894. 40¢ to 55¢	Br. and Ann'd. Nos. 16 to 18. 82¢ to 85¢ Nos. 18 to 20. 82¢ to 85¢ Nos. 27 to 30. 82¢ to 85¢ Annealed Wire on Spools 82¢ to 85¢ Brass, list April 9, 1894. 40¢ to 55¢ Cast Steel Wire 60¢ Copper, list Jan. 18, 1894. 40¢ to 55¢	Wrenches— American Adjustable 40¢ to 45¢ Baxters' 60¢ to 65¢ to 10¢ Coss' Genuine 60¢ to 65¢ to 10¢ Coss' "Mechanics" 50¢ to 10¢ to 15¢ Girard Standard 65¢ to 10¢ to 15¢ Lamson & Sessions' Engineers' 60¢ to 10¢ Lamson & Sessions' Standard 70¢ to 10¢ Girard Agricultural P. S. & W. Agricultural 75¢ to 10¢ to 10¢ W. & B. Diamond 50¢ to 60¢ to 10¢ Acme, Bright 50¢ to 60¢ to 10¢

Paints, Oils and Colors.—Wholesale Prices.

White Lead, Zinc, &c.	1¢ on 500 to 1000 lb. purchased during the season.	Paints in Oil.	Paints in Oil.
Lead, Eng., B.B. white 5 1/2¢ to 5 1/2¢	Green, Chrome, ordinary 6 @ 12	Black, Drop, Frankfort 25 @ 3¢	Lard, City, Extra Winter 57 @ ..
Lead, Amn. White: Dry 4 @ 4 1/2¢	Green, Chrome, pure 22 @ 25	Black, Drop, English 12 @ 15	Lard, City, Prime 56 @ ..
In Oil 5 1/2¢ to 5 1/2¢	Lead, Red, bbls. and 1/2 bbls. 4 1/2¢ to 5	Black, Drop, Domestic 7 @ 10	Lard, City, Extra No. 1 43 @ ..
Lead, White, in oil, 25 lb. tin pails, add to keg price 8 @ 3¢	Litharge, kegs 4 1/2¢ to 5	Black, Lampblack, Best 20 @ 35	Lard, Weather, prime 58 @ ..
Lead, White, in oil, 12 1/2 lb. tin pails, add to keg price 8 @ 1	Litharge, bbls. and 1/2 bbls. 5	Black, Lampblack, Common 7 @ 18	Cotton seed, Crude, prime 25 @ ..
Lead, White, in oil, 1 to 5 lb. assorted tins, add to keg price 2 1/2¢	Ocher, Rochelle 1.35 @ 1 1/2	Black, Ivory 8 @ 12	Cotton seed, Crude, off grades 24
Zinc, American, dry 2 1/2¢ to 2 1/2¢	Ocher, French Washed 1.45 @ 2 1/2	Blue, Chinese 35 @ 40	Cotton seed, Summer, Yellow, prime 31 @ ..
Zinc, French, Red Seal 7 @ 7 1/2¢	Ocher, German Washed 1.45 @ 3	Blue, Ultramarine 20 @ 25	Cotton seed, Summer, Yellow, off grades 28 @ ..
Zinc, French, Green Seal 8 1/2¢ to 9 1/2¢	Ocher, American 1.45 @ 1 1/2	Brown, Vandyke 7 @ 12	Sperm, Crude 57 @ ..
Zinc, French, V. M. X. 6 1/2¢ to 7 1/2¢	Orange Mineral, English 7 1/2 @ 10	Green, Chrome 8 @ 18	Sperm, Natural Spring 55 @ ..
Zinc, Antwerp, Red Seal 6 1/2¢ to 7 1/2¢	Orange Mineral, French 10 @ 10 1/2	Green, Paris 16 @ 18	Sperm, Bleached Spring 60 @ ..
Zinc, Antwerp, Green Seal 6 1/2¢ to 7 1/2¢	Orange Mineral, German 7 1/2 @ 8	Sienna, Raw 7 @ 14	Sperm, Natural Winter 62 @ ..
Zinc, German, L. Z. O. 5 @ ..	Orange Mineral, American 7 1/2 @ 8	Sienna, Burnt 7 @ 14	Sperm, Bleached Winter 67 @ ..
Seal, lots of 1 ton and over 10 1/2¢	Red, Indian, English 2 @ 5	Umber, Raw 7 @ 10	Whale, Crude 32 @ ..
lots less than one ton 11 @ ..	Red, Indian, American 2 @ 5	Umber, Burnt 7 @ 10	Whale, Natural Winter 41 @ ..
Zinc, V. M. in Poppy Oil, Red Seal 9 1/2¢ to 10 1/2¢	Red, Turkey 9 @ 14	Whale, Bleached Winter 43 @ ..	Whale, Extra Bleached 46 @ ..
lots of 1 ton and over 9 1/2¢ to 10 1/2¢	Red, Tuscan 7 @ 10	Whale, Extra Bleached, Winter 46 @ ..	Sea Elephant, Bleached
lots of less than one ton 10 1/2¢	Red, Venetian, English 10 @ 100 lb. 1.00 @ 1.35	Black, French 40 @ 1 1/2	Winter 48 @ ..
Red Seal 10 1/2¢	Red, Venetian, Italian, Burnt and Powd. 10 @ 1.35	Black, American 1.00 @ 1 1/2	Menhaden, Crude, Sound 22 @ ..
lots of 1 ton and over 9 1/2¢ to 10 1/2¢	Sienna, Ital., Burnt Lumps 4 @ 5	Black, Drop, Raw, Powd. 45 @ 5 1/2	Menhaden, Crude, Southern 22 @ ..
lots of less than one ton 10 1/2¢	Sienna, Ital., Raw, Powd. 4 1/2 @ 5 1/2	Chalk, in bulk, 1/2 ton 1.75 @ 2.00	Menhaden, Light Pressed 25 @ ..
Discounts—French Zinc—Discounts to buyers of 10 bbl. lots of one or more assortments, 1/2, 25 bbls., 2 1/2, 50 bbls. 45¢. No discount allowed on less than bbl. lots	Sienna, Ital., Raw, Lumps 4 1/2 @ 5 1/2	Chalk, in bbls., 100 lb. 35 @ 40	Menhaden, Bleached W'ter 32 @ ..
Dry Colors.	Sienna, American, Raw 1.45 @ 1 1/2	China Clay, English 1 ton 13.00 @ 18.00	Menhaden, Extra Bleached 35 @ ..
Blue, Celestial 2 1/2¢ to 3 1/2¢	Powdered 2 1/2 @ 3 1/2	Cobalt, Oxide, 2 1/2 lb. 40 @ 45	Tallow, City, prime 51 @ ..
Blue, Chinese 40 @ 50	Umber, French 2 1/2 @ 3 1/2	Whiting Common, 2 1/2 lb. 40 @ 45	Cocoanut, Ceylon 50 @ ..
Blue, Prussian 25 @ 40	Umber, Turkey Bnt. Lns. 2 1/2 @ 3 1/2	Whiting Gilders' 50 @ 55	Cocoanut, Cochin 6 @ ..
Blue, Ultramarine 8 @ 25	Umber, Turkey, Raw and Powdered 2 1/2 @ 3 1/2	In barrels and 1/2 bbls. 0.13 @ 0.14	Cod, Domestic 28 @ ..
Brown, Spanish 3 1/2¢ to 4 1/2¢	Umber, Turkey, R'w Lumps 2 1/2 @ 3 1/2	In tubs 0.14 @ 0.14	Cod, Foreign 30 @ ..
Brown, Vandyke, Amer. 3 1/2¢ to 3 1/2¢	Umber, Turkey, R'w Amer. 1.45 @ 1 1/2	In tin cans 0.14 @ 0.14	Red Elaine 35 @ ..
Brown, Vandyke, English 6 @ 8	Umber, Turkey, Burnt and Raw 1.45 @ 1 1/2	In bladders 0.13 @ 0.08	Red Saponified 44 @ ..
Carmine, No. 40, in bulk, 2.00	Carmine, No. 40, in boxes or barrels 2.10 @ ..	Clue—	Bank per gal 24 @ ..
Carmine, No. 40, in boxes or barrels 2.10 @ ..	Carmine, No. 40, in boxes 3.00 @ ..	Low Grade 7 @ 9	Strait 25 @ ..
Green, Paris, in bulk 23¢	Carmine, No. 40, in boxes 23¢	Cabinet 11 @ 13	Olive, Italian, bbls. 56 @ ..
Green, Paris, 170 @ 175 kegs 23¢	Carmine, No. 40, in boxes 23¢	Medium White 12 @ 14	Neatfoot, prime 56 @ ..
Rebates—3¢ @ 10¢ on lots of 10,000 lb. or over; 2 1/2¢ @ 2000 to 4000 lb.; 2¢ @ 2000 to 4000 lb.; 1 1/2¢ @ 1000 to 2000 lb.; 1¢ @ 1000 to 1000 lb.; Vermillion, Chinese 85 @ 1.00	Vermillion, American Lead 11 @ 13	Extra White 16 @ 20	Palm, prime, Lagos 5 @ ..
BRITISH AGENCY: Office of The Ironmonger, 42 Cannon Street, London.	Vermillion, Quicks'r, bulk 58 @ ..	French 10 @ 25	
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